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SEQ 7

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SEQ 26

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SEQ 27

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<center>SEQ 28</center>

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SEQ 29

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SEQ 33

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        <213> Human immunodeficiency virus type 1


        <220>
  20    <223> isolate=93BR020; gene=vif


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        <213> Human immunodeficiency virus type 1


    · <220>
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        ataaggatat tgcaacaact actgtttatc catttcagaa ttgggtgccg tcatagcaga 240
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        <220>
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SEQ 35

106

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<212> DNA
<213> Human immunodeficiency virus type 1

<220>

SEQ 36

107

<400> 16

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<212> DNA
<213> Human immunodeficiency virus type 1

SEQ 37

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<210> 18
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<212> DNA
<213> Human immunodeficiency virus type 1

<220>
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        <213> Human immunodeficiency virus type 1

 15     <220>
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        <213> Human immunodeficiency virus type 1
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        <400> 20
 30     aaaaaaaa                                                          8


        <210> 21
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 35     <213> Human immunodeficiency virus type 1

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        <213> Human immunodeficiency virus type 1
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SEQ 39

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<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1

<220>

SEQ 40

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<213> Human immunodeficiency virus type 1

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<210> 25
<211> 2597
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG083; gene=tat

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aaaggcttag gcatctccta tggcaggaag aagcggagac cccgacgagg aactcctcag 180
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   5    aattagatct gaaaatttca cagacaatac caaagtcata atagtgcagc ttaataatag 1260
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        aggacaagcg ttctatgcaa caggtgatat aataggagac ataagacaag cacattgtaa 1380
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   10   acatagtttc aattgtagag gagagttttt ctattgcaat acatcaggac tgtttaataa 1560
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        <211> 2663
        <212> DNA
        <213> Human immunodeficiency virus type 1


   35   <220>
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        atagaaaaat aagaaaacag aaaaaaatag aaaagttact tgatagaata agagaaagag 240
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        aagccatgtg taaagctaac tcctctctgt atcactttaa actgtactaa tgtaaacagt 660
   50   gctaatcata ctgaggccaa taacactgta gaaacaaag aagaaataaa aaactgctct 720
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        cttgatgtgg taccaattag taatgggaat aagactagtt ataggctaat acattgtaat 840
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acaggtgata taataggaga cataagacaa gcacattgta atgttagtag aataaaatgg 1260
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<210> 27
<211> 26
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG083; gene=vpu (defective); note=10 bp
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      premature termination

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<210> 28
<211> 2550
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG083; gene=env

<400> 28
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SEQ 43
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//4
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         agagatggtg ggaataacaa tgacagtaca gaggagacct tcagacctgg aggaggagat 1380
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         ggagtagcac ccaccagggc aaggagaaga gtggtggaga gagaaaaaag agcagttgga 1500
         ctgggagctg tcttccttgg gttcttagga gcagcaggga gcactatggg cgcggcgtca 1560
   25    ataacgctga cggcacaggt cagacaatta ttgtctggca tagtgcaaca gcaaagcaat 1620
         ttgctgaggg ctatagaggc gcagcagcat ctgttgcaac tcacagtctg ggcattaaa 1680
         cagctccagt caagagtcct ggctatagaa agatacctaa aggatcaaca gctcctaggg 1740
         atttggggct gctctggaaa actcatctgc accactaatg tgccctggaa cactagttgg 1800
         agtaataaat cttataatga gatttgggat aacatgactt ggctagaatg ggaaagggaa 1860
   30    attcacaatt acacacaaca catatacagc ctgattgaag aatcgcagaa ccagcaggaa 1920
         aagaatgaac aagacttatt ggcattggac aagtgggcaa gtttgtggaa ttggtttgac 1980
         atatcaaatt ggctatggta tataagaata ttcataatga tagtaggagg tttaataggt 2040
         ttaagaatag tttttgctgt gctttctata gtaaatagag ttaggcaggg atactcacct 2100
         ttgtcgttcc agacccttac ccatcaccag cgggaacccg acaggctcgg aaaaaccgaa 2160
   35    gaaggaggtg gcgagcaaga cagagacaga tccactcgat tagtgagcgg attcttagcg 2220
      .  cttgcctggg acgacctgcg gagcctgtgc cttttcagct accaccgctt gagggactta 2280
         gtcttgattg cagcaaggac ggtggaactt ctgggacgca gcagcctcaa gggactgaga 2340
         ctggggtggg aaggcctcaa gtacttgtgg aacctcctgt tgtattgggg tcgggaacta 2400
    .    aagaatagtg ctattaattt gcttgataca atagcaatag caacagctaa cgggacagat 2460
   40    agggttatag aagtagcaca aagagcttat agagctattc tcaacgtacc tacaaggata 2520
         agacaaggct tagaaagagc tttgctataa                                  2550


       <210> 29
       <211> 1503
   45  <212> DNA
       <213> Human immunodeficiency virus type 1

       <220>
       <223> isolate=90CR056; gene=gag; CDS:
   50       join(137..1434,1434..4443)

       <400> 29
       atgggtgcga gagcgtcagt attaagcggc ggaaaattag atgcttggga gaaaattcgg 60
       ctaaggccag ggggaaagaa aaaatatagg ctaaaacatc tagtatgggc aagcagggag 120
```

SEQ 44

```
ctggaaagat ttgcacttaa ccccggcctt ttagaaacac cagaaggctg tctacagata 180
atagaacaga tacagccagc tattaagaca ggaacagaag aacttaaatc attatttaat 240
ctagtagcag tcctctattg cgtacatcga aaaatagatg tgaaagacac caaggaggct 300
ttagataaga tagaggaaat acaaaacaaa agtcagcaaa aaacacagca agcagcagct 360
gataaggaaa aagacaacaa ggtcagtcaa aattatccta tagtacagaa tgctcaaggg 420
cagatggtac accaggccat atcacctagg accttaaatg catgggtaaa agtagtagaa 480
gaaaaggctt ttagcccaga agtaataccc atgttttcag cattatcaga aggagccacc 540
ccacaagact aaatgctat gctaaataca gtggggggac atcaagcagc catgcagatg 600
ttaaaagata caatcaatga ggaagctgca gaatgggaca gggtacatcc agtgcatgca 660
gggcctattc caccaggcca aatgagagaa ccaaggggaa gcgatatagc aggaactact 720
agtaccctgc aggaacaaat agcatggatg acaggcaatc cagctatccc agtgggagac 780
atctataaaa gatggataat cctgggatta aataagatag taagaatgta tagtcctgtc 840
agcattctgg acataaaaca agggccaaaa gaacccttta gagactatgt agacaggttt 900
tttaaaactt taagagctga gcaagccaca caggatgtga agaattggat gacagaaacc 960
ttgttggtcc aaaatgcaaa tccagattgc aagactatat taagagcatt aggacaaggg 1020
gcttcaatag aagaaatgat gacagcatgt cagggagtgg gaggacctag tcataaagca 1080
agagtttttgg ctgaggcaat gagccaagta acaaatacaa atacagccat aatgatgcag 1140
aaaggcaact ttaagggcca aagaaaattt gttaaatgct tcaactgtgg caaagaggga 1200
cacatagcca gaaattgcag ggcccctagg aaaaagggct gttggaaatg tggaagagaa 1260
ggacatcaga tgaaagactg cacagagaga caggctaatt ttttagggaa aatttggcct 1320
tccagcaaag ggaggccagg aaattttctc cagagcaggc cagaaccaac agccccacca 1380
gcagagagct tcgggttcgg agaggagatg accccctctc cgaagcagga gcagctgaag 1440
gacaaggaac ctcccttagc ttccctcaga tcactctttg gcagcgaccc cttgttacag 1500
taa                                                                1503
```

<210> 30
<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=90CR056; gene=vif

<400> 30
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atggaaaaca gatggcaggt gatgattgtg tggcaagtag acaggatgag gattaacaca 60
tggaaaagct tagtaaagta ccatatgcat atttcaagga aagctagagg atggttttat 120
agacatcatt ttgaaagcac tcatccaagg ataagttcag aagtacacat cccattagga 180
gaagctaggt tagtcataac cacatactgg ggtctgaata caggagaaag agaatggcat 240
ttaggccagg gagtctccat agaatggaga ctgaaaaggt atagcacaca agtagagcct 300
ggcctggcag accaactaat tcatatgcat tattttgatt gtttttcaga atctgccata 360
aggaaagcca tattaggacg tgtagttaga cctaggtgta actatccagc aggacataaa 420
caggtaggaa ctctacaata cttggcatta acagcattag tggcaccaaa aaagataaag 480
ccacctttgc ctagtgttag aaagctagta gaggatagat ggaacaagcc ccagaagacc 540
aggggccaca gagggagcca cacaatgaat ggacactag                         579
```

<210> 31
<211> 291
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=90CR056; gene=vpr

<400> 31

SEQ 45

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atggaacaag ccccagaaga ccaggggcca cagagggagc cacacaatga atggacacta 60
gagcttttag aggagattaa gaatgaggct gttaggcatt ttcctagagt atggctccat 120
caattaggac agcatatcta taacacctat ggagatactt gggtaggagt tgaagcttta 180
ataagaacgc tgcaacaact actgtttatt catttcagaa ttgggtgcca acatagcaga 240
ataggaatta ctcgacagag aagagtaaga aatggaccca gtagatccta a          291
```

<210> 32
<211> 624
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG083; gene=nef

<400> 32
```
atggggggca agtggtcaaa aagtagcata gttggatggc tcagataag ggaaagaata 60
agacaaactc ctgtagcagc agaaggagta ggagcagtat ctcaagattt agctaggcat 120
ggagcaatca caagcagcaa tacagcaacc aacaatcctg attgtgcctg gctggaagca 180
caagaggagg actcagatgt aggctttccg gtcagaccac aggtaccttt gagaccaatg 240
acttataagg ctgcttttga tctcagcttc tttttaaaag aaaaggggggg actggatggg 300
ctaatttact ccaagagaag acaagacatc cttgatctat gggtctataa tacacaagga 360
ttcttcccag attggcagaa ctacacacca gggccaggga ctagactccc actgaccttt 420
gggtggtgct tcaaactagt accaatggac ccagcagaga tagaggaagc caataaggga 480
gagaacatca gtctattaca ccccatctgc cagcatggaa tggaggatga agacagagaa 540
ccggagtact acaaagactg ctga                                       624
```

<210> 33
<211> 2606
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=90CR056; gene=tat; CDS: join (5177..5391,
      7698..7782)

<400> 33
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gcttgtaaca attgttattg taaaaagtgc tgctatcatt gccaaatgtg ctttttaaag 120
aaaggcttag gaatttccta tggcaggaag aagcggagcc agcgacacag aactcctgca 180
agtttgcaag atcatcaaaa ttctatatca aagcagtaag tattatcata aatgtatata 240
atagtatata tagaatataa aaaattggta aggcaaaaga aaatagacag gctaattgaa 360
tccaagctta tggagatggg gcaccttaat cttgggtatg ttgctgatct gtagtgctgc 480
acaaaacttg tgggttacag tatattatgg ggtacctgtg tggaaagagg caaaaaccac 540
tctattctgt gcatcagatg ctaaggcata tgagacagaa aagcataatg tctgggctac 600
acatgcatgt gtacccacag accccaaccc acaagagatg gtcatggaga atgtaacaga 660
gagctttaat atgtgggaaa ataacatggt ggagcagatg catacagaca taatcagttt 720
atgggatcaa agcttgaaac catgtgtaaa attaaccca ctctgtgtta ctctaaactg 780
tactaatgtc agaaacaata cctctaacag cactagcagt atggaggcag gaggggaact 840
aacaaattgc tctttcaatg taactacagt actaagagat aagcagcaga aagtacatgc 900
actcttttat agacttgatg tagtaccaat tgataacaat agtactcagt ataggctaat 960
aaattgtaat acctcagtca ttacacaggc ttgcccaaag gtgtcctttg aacctattcc 1020
```

SEQ 46

117   *B*

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catacattat tgtgctccag ctggctttgc gattctaaag tgtaacaata aaacattcaa 1080
tggaacagga ttatgtacaa atgtcagtac agtacaatgt acacatggaa ttagaccagt 1140
ggtatcaact caactgctat taaatggaag cctagcagaa gaacagatca taattagaac 1200
taaaaatatc tcagacaata ccaaaaacat aatagtacag cttaagacac cagtaaacat 1260
tacatgtacc aggcctaaca ataatacgag aacaagtata catttagggc aggacgagc 1320
attctatgca acaggtgaca tcataggaga tataagacaa gcacattgta atattagtag 1380
aacagactgg aataagactt tacaccaggt agttacacaa ttaggaatac acttgaacaa 1440
tagaacaata agctttaagc caaactcagg aggggacatg gaagttagaa cacatagttt 1500
taattgtaga ggagaatttt tctattgcaa tacatcaggg ctgtttaata gtagttggga 1560
aatgcatact aattacacat caaatgacac aaagggaaac gaaaacatta cactgccatg 1620
cagaataaaa caaattgtaa acatgtggca gagagtagga cgagcaatgt atgcccctcc 1680
catccaagga aacattatgt gtgtatcaaa tattacagga ctaatattga caattgacga 1740
gggtaacgcg tctgcagaaa attatacctt cagacctgga ggaggagata tgagggacaa 1800
ttggagaagt gaattgtata aatataaagt agtaaaaatt gaaccactgg gaatagcacc 1860
tttccttggg ttcttgggag cagcaggaag cactatgggc gcggcgtcaa taacgctgac 1920
ggtacaggcc aggcaattat tgtctggtat agtgcagcag caaagcaatt tgctgagagc 1980
tatacaggcg cgacagcata tgttgcagct cacggtctgg ggcattaaac agctccaggc 2040
aagagtcctc gctgtggaaa gatacctaag ggatcaacag ctcctgggga tttggggctg 2100
ctctggaaaa ctcatctgca ccactaatgt gccttggaac tctagttgga gtaataaatc 2160
acagagtgaa atctgggaca acatgacttg gatggaatgg gataaacaaa ttagcaatta 2220
cacagaggaa atatacaggt tgcttgaagt ctcgcaaacc cagcaggaaa agaatgaaca 2280
ggacttatta gcattggaca aatgggcaag tctgtggact tggtttgaca tatcacattg 2340
gctgtggtat ataaaaatat tcataatgat agtaggaggt ttaataggtt taagaataat 2400
ttttgctgtg ctttctatag taaatagagt taggcaggga tactcacctt tgtcttttca 2460
gacccttgtc ccgaacccac ggggacccga caggcccgaa ggaacagaag aaggaggtgg 2520
cgagcaagac agagacagat ccgtga 2580
                                                                2606
```

<210> 34
<211> 2657
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=90CR056; gene=rev; CDS: join(5316..5391,
      7698..7972)

<400> 34

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attctatatc aaagcagtaa gtattatcat aaatgtatat attaggatta ggaataggag 120
cgctagtagt aacatttatc atagccgtaa ttgtgtggac catagtatat atagaatata 180
aaaaattggt aaggcaaaag aaaatagaca ggctaattga aagaatagga gaaagagcag 240
aagacagtgg caacgagagt gatggagaca cagaggaatt atccaagctt atggagatgg 300
gtatattatg gggtacctgt gttgctgatc tgtagtgctg cacaaaactt gtgggttaca 360
gctaaggcat atgagacaga aaagcataat gtctgggcta cacatgcatg tgtacccaca 420
gaccccaacc cacaagagat ggtcatggag aatgtaacag agagctttaa tatgtgggaa 480
aataacatgg tggagcagat gcatacagac ataatcagtt tatgggatca aagcttgaaa 540
ccatgtgtaa aattaacccc actctgtgtt actctaaact gtactaatgt cagaaacaat 600
acctctaaca gcactagcag tatggaggca ggaggggaac taacaaattg ctctttcaat 660
gtaactacag tactaagaga taagcagcag aaagtacatg cactctttta tagacttgat 720
gtagtaccaa ttgataacaa tagtactcag tataggctaa taaattgtaa tacctcagtc 780
attacacagg cttgcccaaa ggtgtccttt gaacctattc ccatacatta ttgtgctcca 840
gctggctttg cgattctaaa gtgtaacaat aaaacattca atggaacagg attatgtaca 960
```

SEQ 47

```
aatgtcagta cagtacaatg tacacatgga attagaccag tggtatcaac tcaactgcta 1020
ttaaatggaa gcctagcaga agaacagatc ataattagaa ctaaaaatat ctcagacaat 1080
accaaaaaca taatagtaca gcttaagaca ccagtaaaca ttacatgtac caggcctaac 1140
aataatacga gaacaagtat acatttaggg ccaggacgag cattctatgc aacaggtgac 1200
atcataggag atataagaca agcacattgt aatattagta gaacagactg gaataagact 1260
ttacaccagg tagttacaca attaggaata cacttgaaca atagaacaat aagctttaag 1320
ccaaactcag gaggggacat ggaagttaga acacatagtt ttaattgtag aggagaattt 1380
ttctattgca atacatcagg gctgtttaat agtagttggg aaatgcatac taattacaca 1440
tcaaatgaca caaagggaaa cgaaaacatt acactgccat gcagaataaa acaaattgta 1500
aacatgtggc agagagtagg acgagcaatg tatgccctc ccatccaagg aaacattatg 1560
tgtgtatcaa atattacagg actaatattg acaattgacg agggtaacgc gtctgcagaa 1620
aattatacct tcagacctgg aggaggagat atgagggaca attggagaag tgaattgtat 1680
aaatataaag tagtaaaaat tgaaccactg ggaatagcac ccaccaagac aaggagaaga 1740
gtggtggaga gagaaaaaag agcagtggga atgggagctt ctttccttgg gttcttggga 1800
gcagcaggaa gcactatggg cgcggcgtca ataacgctga cggtacaggc caggcaatta 1860
ttgtctggta tagtgcagca gcaaagcaat ttgctgagag ctatacaggc gcgacagcat 1920
atgttgcagc tcacggtctg gggcattaaa cagctccagg caagagtcct cgctgtggaa 1980
agatacctaa gggatcaaca gctcctgggg atttggggct gctctggaaa actcatctgc 2040
accactaatg tgccttggaa ctctagttgg agtaataaat cacagagtga aatctgggac 2100
aacatgactt ggatggaatg ggataaacaa attagcaatt acacagagga aatatacagg 2160
ttgcttgaag tctcgcaaac ccagcaggaa aagaatgaac aggacttatt agcattggac 2220
aaatgggcaa gtctgtggac ttggtttgac atatcacatt ggctgtggta tataaaaata 2280
ttcataatga tagtaggagg tttaataggt ttaagaataa tttttgctgt gctttctata 2340
gtaaatagag ttaggcaggg atactcacct ttgtcttttc agacccttgt cccgaaccca 2400
cggggacccg acaggcccga aggaacagaa gaaggaggtg gcgagcaaga cagagacaga 2460
tccgtgagat tagtgaacgg attcttacca gttgtctggg acgacctccg gagcctgtca 2520
ctcttcagct accgcctctt gagagactta ctcttaattg tagtgaggac tgtggaactt 2580
ctggggagaa gggggaggga agccctcaaa tatctctgga atcttctaca atactgggga 2640
caggaactaa agaatag                                               2657
                                                                 2657
```

<210> 35
<211> 243
<212> DNA
<213> Human immunodeficiency virus type 1

. <220>
<223> isolate=90CR056; gene=vpu

` <400> 35
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atgtatatat taggattagg aataggagcg ctagtagtaa catttatcat agccgtaatt 60
gtgtggacca tagtatatat agaatataaa aaattggtaa ggcaaaagaa aatagacagg 120
ctaattgaaa gaataggaga aagagcagaa gacagtggca acgagagtga tggagacaca 180
gaggaattat ccaagcttat ggagatgggg cacttaatc ttgggtatgt tgctgatctg 240
tag                                                              243
                                                                 243
```

<210> 36
<211> 2538
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=90CR056; gene=env

<400> 36

SEQ 48

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          atggagacac agaggaatta tccaagctta tggagatggg gcaccttaat cttgggtatg 60
          ttgctgatct gtagtgctgc acaaaacttg tgggttacag tatattatgg ggtacctgtg 120
          tggaaagagg caaaaaccac tctattctgt gcatcagatg ctaaggcata tgagacagaa 180
      5   aagcataatg tctgggctac acatgcatgt gtacccacag accccaaccc acaagagatg 240
          gtcatggaga atgtaacaga gagctttaat atgtgggaaa ataacatggt ggagcagatg 300
          catacagaca taatcagttt atgggatcaa agcttgaaac catgtgtaaa attaacccca 360
          ctctgtgtta ctctaaactg tactaatgtc agaaacaata cctctaacag cactagcagt 420
          atggaggcag gaggggaact aacaaattgc tctttcaatg taactacagt actaagagat 480
     10   aagcagcaga aagtacatgc actctttat agacttgatg tagtaccaat tgataacaat 540
          agtactcagt ataggctaat aaattgtaat acctcagtca ttacacaggc ttgcccaaag 600
          gtgtcctttg aacctattcc catacattat tgtgctccag ctggctttgc gattctaaag 660
          tgtaacaata aaacattcaa tggaacagga ttatgtacaa atgtcagtac agtacaatgt 720
          acacatggaa ttagaccagt ggtatcaact caactgctat aaatggaag cctagcagaa 780
     15   gaacagatca taattagaac taaaaatatc tcagacaata ccaaaaacat aatagtacag 840
          cttaagacac cagtaaacat tacatgtacc aggcctaaca ataatacgag aacaagtata 900
          catttagggc caggacgagc attctatgca acaggtgaca tcataggaga tataagacaa 960
          gcacattgta atattagtag aacagactgg aataagactt tacaccaggt agttacacaa 1020
          ttaggaatac acttgaacaa tagaacaata agctttaagc caaactcagg aggggacatg 1080
     20   gaagttagaa cacatagttt taattgtaga ggagaatttt tctattgcaa tacatcaggg 1140
          ctgtttaata gtagttggga aatgcatact aattacacat caaatgacac aaagggaaac 1200
          gaaaacatta cactgccatg cagaataaaa caaattgtaa acatgtggca gagagtagga 1260
          cgagcaatgt atgccctcc catccaagga aacattatgt gtgtatcaaa tattacagga 1320
          ctaatattga caattgacga gggtaacgcg tctgcagaaa attatacctt cagacctgga 1380
     25   ggaggagata tgagggacaa ttggagaagt gaattgtata aatataaagt agtaaaaatt 1440
          gaaccactgg gaatagcacc caccaagaca aggagaagag tggtggagag agaaaaaaga 1500
          gcagtgggaa tgggagcttc tttccttggg ttcttgggag cagcaggaag cactatgggc 1560
          gcggcgtcaa taacgctgac ggtacaggcc aggcaattat tgtctggtat agtgcagcag 1620
          caaagcaatt tgctgagagc tatacaggcg cgacagcata tgttgcagct cacggtctgg 1680
     30   ggcattaaac agctccaggc aagagtcctc gctgtggaaa gatacctaag ggatcaacag 1740
          ctcctgggga tttggggctg ctctggaaaa ctcatctgca ccactaatgt gccttggaac 1800
          tctagttgga gtaataaatc acagagtgaa atctgggaca catgacttg gatggaatgg 1860
          gataaacaaa ttagcaatta cacagaggaa atatacaggt tgcttgaagt ctcgcaaacc 1920
          cagcaggaaa agaatgaaca ggacttatta gcattggaca aatgggcaag tctgtggact 1980
     35   tggtttgaca tatcacattg gctgtggtat ataaaaatat tcataatgat agtaggaggt 2040
         ·tactccctt tgtcttttca gacccttgtc ccgaacccac taaatagagt taggcaggga 2100
          ggaacagaag aaggaggtgg cgagcaagac agagacagat ggggacccga caggcccgaa 2160
          ttcttaccag ttgtctggga cgacctccgg agcctgtcac ccgtgagatt agtgaacgga 2220
          agagacttac tcttaattgt agtgaggact gtggaacttc tggggagaag ggggagggaa 2280
     40   gccctcaaat atctctggaa tcttctacaa tactggggac aggaactaaa gaatagtgct 2340
          attgatttgc ttaacaccac agcaatagca gtagctgagg aacagatgg gattatagta 2400
          atagtgcaaa gagcttggag agctattctc cacataccta gaagaataag acagggcttt 2460
          gaaagaagct tgctataa 2538
```
                                                                      2520

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          atgggaggca aatggtcaaa aagtaggatg ggtgggtggt ctactataag ggaaagaatg 60
```
                                      SEQ 49

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     aggcgagctg aaccagtagc agaaggggta ggagcagtgt ctcgagattt ggatagacgc 120
     ggggcagtca caattaataa tacagcatct actaatcgtg atgccgcctg gctggaagca 180
     caagaggacg gggaggaagt aggctttcca gtcaggcctc aggtaccttt aagaccaatg 240
     acctataagg gagcttttga tctcagccat ttttttaaaag aaaaggggggg actggatggg 300
  5  ttaatttact ccaagcaaag acaggacatc cttgatttat gggtctataa cacacaaggc 360
     tacttccctg actggcagaa ctacacacca gggccagggg agagatttcc cctgaccttt 420
     gggtggtgct tcaagctagt accagtaaat ccacaggagg tagaacaggc caatgaagga 480
     gagaacaaca gcttgctaca ccccatgagc ctgcatggaa tggaggatga cgggagagaa 540
     gtgctgatgt ggaaatttga cagtcgacta gcattgacac acttggcccg agtaaagcat 600
 10  ccggagtaca aagactgctg a                                          621

     <210> 38
     <211> 1486
     <212> DNA
 15  <213> Human immunodeficiency virus type 1

     <220>
     <223> isolate=92RW009; gene=gag

 20  <400> 38
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     ttaaagccag ggggggaaaga aaacatatat gatgaaacac ctagtatggg caagcaggga 120
     gctggaaaga tttgcactta accctgacct tttagagaca ccagaaggct gtaaacaaat 180
     aatgagacag ctgcaaccag ctcttcagac aggaacagat gaacttaggt cattatataa 240
 25  tacagtagca accctctatt gtgtacatca aaagatagat gtaaaagaca ccaaggaggc 300
     cttagacaag atagaggaag aacaaaacaa aagtcagcaa aaaacacagc aggcagaagc 360
     agctgacaaa ggaaaagtca gtcaaaatta ccctatagtg caaaatgcac aagggcaaat 420
     ggtacaccag gccatatcac ctagaacttt gaatgcgtgg gtaaaagtaa tagaggagaa 480
     ggcttttagc caagaggtaa tacccatgtt tacagcatta tcagaaggag ccaccccaca 540
 30  agatttaaac accatgctaa atacagtggg gggacatcaa gcagccatgc aaatgctaaa 600
     agatacaatc aatgaggagg ctgcagagtg ggatagggta catccagtgc aggcagggcc 660
     tgttgcgcca ggccagataa gagaaccaag gggaagtgac atagcaggaa ctactagtac 720
     ccttcaggaa caaatagcat ggatgacaaa taacccacct attccagtgg gagaaattta 780
     taaagatgg ataattctgg ggttaaataa aatagtaaga atgtatagcc ctgtcagcat 840
 35  attggacata aaacaagggc caaaggaacc ttttagagac tatgtagacc ggttctttaa 900
     aaccttaaga gccgaacaag cttcacaaga tgtaaaaaat tggatgacag ataccttgtt 960
     agtccaaaat gcgaacccag attgtaagac cattttaaga gcattagggc caggggcttc 1020
     attagaagaa atgatgacag catgccaggg agtgggagga cccggccata aagcaagggt 1080
     tttggctgaa gcaatgagcc aagtacaaca accaaacata atgatgcaga gaggcaattt 1140
 40  taagggccag agaagaatta ttaagtgttt caactgtggc aaagaaggac acctagccag 1200
     aaattgcagg gcccctagaa aaaagggctg ttggaaatgt ggaaaggagg gacaccaaat 1260
     gaaagactgc actgagagac aggctaattt tttagggaaa atttggcctt ccaacaaggg 1320
     gaggccagga aattttcccc agagcagact ggagccaaca gccccaccag cagagaactt 1380
     tggaatgggg gaagagatag cctctcctct gaaacaggag cagaaagaca gggaaccttt 1440
 45  aatttccctc aaatcactct ttggcaacga ccccttgtca cagtaa             1486

     <210> 39
     <211> 579
     <212> DNA
 50  <213> Human immunodeficiency virus type 1

     <220>
     <223> isolate=92RW009; gene=vif
```

SEQ 50

121

<400> 39

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atggaaaaca gatggcaggt gatgattgtg tggcaggtag acaggatgaa gattagaaca 60
tggaatagtc tagtaaagca ccatatgtat gcttcaagga gagctaaggg atggtttat 120
agacatcatt atgaaagcag acatccaaaa ataagttcag aagtacacat cccattaggg 180
gaagctagat tagtaataaa aacatattgg ggtttgcaaa caggggaaag agattggcat 240
ttgggtcatg gagtctccat agaatggaga ttgagaagat ataagacaca agtagaccct 300
ggcctggcag gccaactaat ccatatgcat tattttgatt gttttgcaga ctctgccata 360
aggaaagcca tattaggaca tatagttagc cctaggtgtg actatcaagc aggacataat 420
aaggtaggat ctctacaata cttggcactg acagcattga taaaaccaaa aaagataaag 480
ccacctctgc ctagtgttag taaattagta gaggataaat ggaacaagcc ccagaagacc 540
aggggccgca gagggaacca tacaatgaat ggacactag 579
```

<210> 40
<211> 291
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92RW009; gene=vpr

<400> 40

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atggaacaag ccccagaaga ccaggggccg cagagggaac catacaatga atggacacta 60
gagcttttag aggcactcaa gcaggaagct gtcagacact tcctagacc atggctccat 120
gacttaggac aatatatcta tgaaacctat ggggatactt ggaggggagt agaagctata 180
ataagaattc tgcaacaact actgtttatc catttcagaa ttgggtgccg gcatagcaga 240
ataggcattt tgcaacagag aagagcaaga aatggagcca gtagatccta a 291
```

<210> 41
<211> 2640
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92RW009; gene=tat

<400> 41

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atggagccag tagatcctaa actagagccc tggaaccatc caggaagtca gcctaaaact 60
gcctgtaata actgttattg taaacactgt agctatcatt gtctagtttg cttccaggca 120
aaaggcttag gcatttccta tggcaggaag aagcggagac agcgacgaaa cgctcctcca 180
agcagtgaag atcatcaaaa tcctatatca aagcagtaag tagtaataaa cagtatatgt 240
aatgacttct ttagaaatct atgcaatagt agcactgata gtggcgctaa tcatagtgat 300
agttgtgtgg actttagcag gtatagaata aagaaattg ctaaagcaaa ggaaaataga 360
taggttaatt aagaaaataa gagaaagagc agaagatagt ggcaatgaga gtgatgggga 420
cattgatgaa ttatcaaaac ttgtgggggt ggggaactat gatcttgggg atgttaacaa 480
tttgtagtgc tgcaaacaac ttgtgggtta ctgtctacta ggggtacct gtgtggaaag 540
acgcagagac caccttattt tgtgcatcag atgctaaagc atatgatcca gaaaagcata 600
atgtctgggc tacacatgcc tgtgtaccca tagaccccga cccacaagaa atacatttgg 660
aaaatgtgac agaagagttt aacatgtgga aaaataacat ggtagagcag atgcatacag 720
atataatcag tctatggac caaagcctaa agccatgtgt aaagttaacc cctctctgcg 780
ttactttaga gtgtaacaac atcaccaatg tcaacaacac tgtcaacatt acggatgaca 840
tgaaaggaga aataaaaaac tgctctttca atatgaccac agaattaagg gataagaaac 900
agagagtgta ttcactttt tataggcttg atatagtaca aattaatagc aatagtaata 960
acagtagtca taatcagtat aggttaataa attgtaatac ctcagccatt acacaggctt 1020
gtccaaaggt atcctttgag ccaattccca taaattattg tgccccagct ggtttcgcga 1080
```

SEQ 51

```
ttctaaagtg taaagataaa aagttcaatg gaacagggcc atgcaagaat gtcagcacag 1140
tacaatgcac acatggaatc aagccagtag tatcaactca gctgctgtta aatggcagtc 1200
tagcagaaga agagataata attagatctg aaaatattac aaacaatgcc aaaaccataa 1260
tagtacaact taacgagact gtacaaatta attgttccag acctaacaac aatacaagaa 1320
aaagtgtaca tataggacca ggacaagcat tttatgcaac aggtgacgta ataggggata 1380
taagacaagc atattgtact gtcaatggaa caaaatggaa tagaacttta caaaaggtag 1440
cagaaaaatt aagtcactac tttgagaaca ttacaacaat aattttaag aactcctcag 1500
ggggggattt agaaattaca acacatagtt ttaattgtgg aggagaattt ttctattgta 1560
atacatcagg cttgtttaat agcacctgga gtaaaagaaa tggcacctgg cagtcaaatg 1620
gcacagaatt aaatataaca ctcccatgca gaataaagca aattataaat atgtggcaga 1680
ggacaggaca agcaatgtat gcccctccca tccaggagt aataagctgt gtatcaaaca 1740
ttacaggact actattaaca agagatggtg gaaataataa tactacaact gaaaccttca 1800
gacctggagg aggagatatg agggataatt ggagaagtga actatataaa tataaagtag 1860
taaaaattga accactagga gtagcaccca ccagggcaaa gaggagagtg gtggagagag 1920
aaaaaagagc agttggactg ggagctgtct tcattgggtt cttaggagca gcaggaagca 1980
ctatgggcgc ggcgtcaata cgctgacgg tacaggccag acaattattg tctggcatag 2040
tgcaacagca aagcaatttg ctgagggcta tagaggctca acagcatcta ttaaaactca 2100
cagtctgggg cattaaacag ctccaggcaa gagtcctggc tctggaaaga tacctaaggg 2160
atcaacagct cctaggaatt tggggctgct ctggaaaact catctgcacc actaatgtgc 2220
cctggaactc tagttggagt aataagactc agcaggaaat atgggataac atgacctggc 2280
agcaatggga taaagaaatt ggcaattaca cacaaataat atatagtcta attgaagaat 2340
cgcagaacca gcaggaaaag aatgaacaag acttattggc attggacaag tgggcaaatc 2400
tgtggaattg gtttgacata tcaaattggc tgtggtatat aaaaatattc ataatgatag 2460
taggaggctt aataggttta agaataattt ttgctgtgct ctctatagtg aacagagtta 2520
ggcagggata ctcaccatta tcgtttcaga cccttatccc aaacccgagg ggacccgaca 2580
ggctcggagg aatcgaagaa gaaggtggag agcaagacag aggcagatcc attcgattag 2640
```

<210> 42
<211> 2658
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92RW009; gene=rev

<400> 42

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atggcaggaa gaagcggaga cagcgacgaa acgctcctcc aagcagtgaa gatcatcaaa 60
atcctatatc aaagcagtaa gtagtaataa acagtatatg taatgacttc tttagaaatc 120
tatgcaatag tagcactgat agtggcgcta atcatagtga tagttgtgtg gacttttagca 180
ggtatagaat ataagaaatt gctaaagcaa aggaaaatag ataggttaat taagaaaata 240
agagaaagag cagaagatag tggcaatgag agtgatgggg acattgatga attatcaaaa 300
cttgtggggg tggggaacta tgatcttggg gatgttaaca atttgtagtg ctgcaaacaa 360
cttgtgggtt actgtctact atggggtacc tgtgtggaaa gacgcagaga ccaccttatt 420
ttgtgcatca gatgctaaag catatgatcc agaaaagcat aatgtctggg ctacacatgc 480
ctgtgtaccc atagaccccg acccacaaga aatacatttg gaaaatgtga cagaagagtt 540
taacatgtgg aaaaataaca tggtagagca gatgcataca gatataatca gtctatggga 600
ccaaagccta aagccatgtg taaagttaac ccctctctgc gttactttag agtgtaacaa 660
catcaccaat gtcaacaaca ctgtcaacat tacggatgac atgaaaggag aaataaaaaa 720
ctgctctttc aatatgacca cagaattaag ggataagaaa cagagagtgt attcactttt 780
ttataggctt gatatagtac aaattaatag caatagtaat aacagtagtc ataatcagta 840
taggttaata aattgtaata cctcagccat tacacaggct gtccaaagg tatcctttga 900
gccaattccc ataaattatt gtgccccagc tggtttcgcg attctaaagt gtaaagataa 960
aaagttcaat ggaacagggc catgcaagaa tgtcagcaca gtacaatgca cacatggaat 1020
caagccagta gtatcaactc agctgctgtt aaatggcagt ctagcagaag aagagataat 1080
```

SEQ 52

```
aattagatct gaaaatatta caaacaatgc caaaaccata atagtacaac ttaacgagac 1140
tgtacaaatt aattgttcca gacctaacaa caatacaaga aaaagtgtac atataggacc 1200
aggacaagca ttttatgcaa caggtgacgt aataggggat ataagacaag catattgtac 1260
tgtcaatgga acaaaatgga atagaacttt acaaaaggta gcagaaaaat taagtcacta 1320
ctttgagaac attacaacaa taatttttaa gaactcctca gggggggatt tagaaattac 1380
aacacatagt tttaattgtg gaggagaatt tttctattgt aatacatcag gcttgtttaa 1440
tagcacctgg agtaaaagaa atggcacctg gcagtcaaat ggcacagaat aaaatataac 1500
actcccatgc agaataaagc aaattataaa tatgtggcag aggacaggac aagcaatgta 1560
tgcccctccc atccaaggag taataagctg tgtatcaaac attacaggac tactattaac 1620
aagagatggt ggaaataata atactacaac tgaaaccttc agacctggag gaggagatat 1680
gagggataat tggagaagtg aactatataa atataaagta gtaaaaattg aaccactagg 1740
agtagcaccc accagggcaa agaggagagt ggtggagaga gaaaaaagag cagttggact 1800
gggagctgtc ttcattgggt tcttaggagc agcaggaagc actatgggcg cggcgtcaat 1860
aacgctgacg gtacaggcca gacaattatt gtctggcata gtgcaacagc aaagcaattt 1920
gctgagggct atagaggctc aacagcatct attaaaactc acagtctggg gcattaaaca 1980
gctccaggca agagtcctgg ctctggaaag atacctaagg gatcaacagc tcctaggaat 2040
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taataagact cagcaggaaa tatgggataa catgacctgg cagcaatggg ataaagaaat 2160
tggcaattac acacaaataa tatatagtct aattgaagaa tcgcagaacc agcaggaaaa 2220
gaatgaacaa gacttattgg cattggacaa gtgggcaaat ctgtggaatt ggtttgacat 2280
atcaaattgg ctgtggtata aaaaatatt cataatgata gtaggaggct aataggttt 2340
aagaataatt tttgctgtgc tctctatagt gaacagagtt aggcagggat actcaccatt 2400
atcgtttcag acccttatcc caaacccgag gggacccgac aggctcggag gaatcgaaga 2460
agaaggtgga gagcaagaca gaggcagatc cattcgatta gtgagcggat tcttagcact 2520
tgcctgggac gacctacgga gcctgtgcct tttcagctac caccgattga gagacttact 2580
attgattgca gcgaggacgg tggaacttct gggacgcagc agtctcaggg gactacagag 2640
ggggtgggaa acccttaa                                                2658
```

<210> 43
<211> 246
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92RW009; gene=vpu

<400> 43
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atgacttctt tagaaatcta tgcaatagta gcactgatag tggcgctaat catagtgata 60
gttgtgtgga ctttagcagg tatagaatat aagaaattgc taaagcaaag gaaaatagat 120
aggttaatta agaaaataag agaaagagca gaagatagtg gcaatgagag tgatggggac 180
attgatgaat tatcaaaact tgtggggggtg gggaactatg atcttgggga tgttaacaat 240
ttgtag                                                              246
```

<210> 44
<211> 2583
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92RW009; gene=env

<400> 44
```
atgagagtga tggggacatt gatgaattat caaaacttgt ggggggtgggg aactatgatc 60
ttggggatgt taacaatttg tagtgctgca aacaacttgt gggttactgt ctactatggg 120
```

SEQ 53

```
          gtacctgtgt ggaaagacgc agagaccacc ttattttgtg catcagatgc taaagcatat 180
          gatccagaaa agcataatgt ctgggctaca catgcctgtg tacccataga ccccgaccca 240
          caagaaatac atttggaaaa tgtgacagaa gagtttaaca tgtggaaaaa taacatggta 300
          gagcagatgc atacagatat aatcagtcta tgggaccaaa gcctaaagcc atgtgtaaag 360
    5     ttaacccctc tctgcgttac tttagagtgt aacaacatca ccaatgtcaa caacactgtc 420
          aacattacgg atgacatgaa aggagaaata aaaaactgct ctttcaatat gaccacagaa 480
          ttaagggata agaaacagag agtgtattca ctttttttata ggcttgatat agtacaaatt 540
          aatagcaata gtaataacag tagtcataat cagtataggt aataaattg taatacctca 600
          gccattacac aggcttgtcc aaaggtatcc tttgagccaa ttcccataaa ttattgtgcc 660
   10     ccagctggtt tcgcgattct aaagtgtaaa gataaaaagt tcaatggaac agggccatgc 720
          aagaatgtca gcacagtaca atgcacacat ggaatcaagc cagtagtatc aactcagctg 780
          ctgttaaatg gcagtctagc agaagaagag ataataatta gatctgaaaa tattacaaac 840
          aatgccaaaa ccataatagt acaacttaac gagactgtac aaattaattg ttccagacct 900
          aacaacaata caagaaaaag tgtacatata ggaccaggac aagcatttta tgcaacaggt 960
   15     gacgtaatag gggatataag acaagcatat tgtactgtca atggaacaaa atggaataga 1020
          actttacaaa aggtagcaga aaaattaagt cactactttg agaacattac aacaataatt 1080
          tttaagaact cctcaggggg ggatttagaa attacaacac atagtttttaa ttgtggagga 1140
          gaatttttct attgtaatac atcaggcttg tttaatagca cctggagtaa aagaaatggc 1200
          acctggcagt caaatggcac agaattaaat ataacactcc catgcagaat aaagcaaatt 1260
   20     ataaatatgt ggcagaggac aggacaagca atgtatgccc ctcccatcca aggagtaata 1320
          agctgtgtat caaacattac aggactacta ttaacaagag atggtggaaa taataatact 1380
          acaactgaaa ccttcagacc tggaggagga gatatgaggg ataattggag aagtgaacta 1440
          tataaatata aagtagtaaa aattgaacca ctaggagtag cacccaccag ggcaaagagg 1500
          agagtggtgg agagagaaaa aagagcagtt ggactgggag ctgtcttcat tgggttctta 1560
   25     ggagcagcag gaagcactat gggcgcggcg tcaataacgc tgacggtaca ggccagacaa 1620
          ttattgtctg gcatagtgca acagcaaagc aatttgctga gggctataga ggctcaacag 1680
          catctattaa aactcacagt ctggggcatt aaacagctcc aggcaagagt cctggctctg 1740
          gaaagatacc taagggatca acagctccta ggaatttggg gctgctctgg aaaactcatc 1800
          tgcaccacta atgtgccctg gaactctagt tggagtaata agactcagca ggaaatatgg 1860
   30     gataacatga cctggcagca atgggataaa gaaattggca attacacaca ataatatat 1920
          agtctaattg aagaatcgca gaaccagcag gaaaagaatg aacaagactt attggcattg 1980
          gacaagtggg caaatctgtg gaattggttt gacatatcaa attggctgtg gtatataaaa 2040
          atattcataa tgatagtagg aggcttaata ggtttaagaa taatttttgc tgtgctctct 2100
   35     atagtgaaca gagttaggca gggatactca ccattatcgt ttcagaccct tatcccaaac 2160
          ccgaggggac ccgacaggct cggaggaatc gaagaagaag tggagagca agacagaggc 2220
        · agatccattc gattagtgag cggattctta gcacttgcct gggacgacct acggagcctg 2280
          tgccttttca gctaccaccg attgagagac ttactattga ttgcagcgag gacggtggaa 2340
          cttctgggac gcagcagtct caggggacta cagaggggggt gggaaaccct taagtatcta 2400
   ·      ggaaatcttg tgcagtattg gggtctggaa ctaaaaagga gtgctattaa tctgcttgat 2460
   40     accacagcaa tagtagtagc tgaaggaaca gataggatta tagaattaat acaaagaatt 2520
          agcagagcta tctataacat acctagcaga ataagacagg ctttgaagc agctttgcaa 2580
          taa
                                                                              2583
          <210> 45
   45     <211> 624
          <212> DNA
          <213> Human immunodeficiency virus type 1

          <220>
   50     <223> isolate=92RW009; gene=nef

          <400> 45
          atgggaagca agtggtcaaa atgtagtcca gtaggatggc ctgctgtaag agaaagacta 60
          aggcaaactg agccagcagc agagggagta ggagcagcgt ctcaagacct agacaaatat 120
```

SEQ 54

/25

V3

```
        ggggcactta caagtagcaa cacacccagc aacaatgctg attgtgcctg gctggcagca 180
        caagaggagg aaaacgaagt aggctttcca gtcagacctc aggtgccttt aagaccaatg 240
        acttataaag cagcagttga tctcagcttc tttttaaaag aaaaggggggg actggaaggg 300
        ttaatttact ctaagaaaag gcaagacatc ctggatttgt gggtctataa cacacaaggc 360
  5     tacttccctg attggcaaaa ctacacacca ggaccagggg tcagatatcc actgactttt 420
        ggatggtgtt acaagctagt gccagttgac ccaagggaag tggaagaagc caatgaagga 480
        gaggacaact gcttactaca ccctctgagc cagcatggaa tggaggatga ggacagagaa 540
        gtcttaaagt ggaagtttga cagtcaccta gcacacagac acatggcccg cgagctacat 600
        ccggagtatt ataaagactg ctga                                        624
 10
        <210> 46
        <211> 8
        <212> DNA
        <213> Human immunodeficiency virus type 1
 15
        <220>
        <223> isolate=92RW009; standard name=3' LTR repeat
             region; note=3' R repeat should end one base
             beyond end of this
 20
        <400> 46
        aaaaaaaa                                                          8

        <210> 47
 25     <211> 1494
        <212> DNA
        <213> Human immunodeficiency virus type 1

        <220>
 30     <223> isolate=92NG003; gene=gag

        <400> 47
        atgggtgcga gagcgtcagt attaagcggg ggaaaattag atgcatggga aaaaattcgg 60
        ttgaggccag ggggaaagaa aaaatataga atgaaacatt tagtatgggc aagcagggaa 120
 35     ctggagagat ttgcacttaa ccctgacctc ttagaaacaa cagaaggttg tcagcaaata 180
    •   atgagacagc tgcaaccatc tctccagaca ggaacagagg agattaaatc attatttaat 240
        acagtagcaa ccctctattg tgtacatcaa aggatagagg taaaagacac caaagaagct 300
        ctagaggaag tggaaaaaat acaaaagaac agtcagcaag aaacacagaa ggcagcaatg 360
        ggtaaaggaa acagcagcca agttagccaa aattatccta tagtgcagaa tgcacaaggg 420
 40     caagtggtac accagcccat atcacctagg actttaaatg catggtaaa agtaatagaa 480
        gaaaagaact tcagtccaga gtaatacccc atgtttacag cattatcaga aggagccacc 540
        ccacaagatt tgaataccat gctaaacacc gtgggggggc atcaagcagc tatgcaaatg 600
        ctaaaagatt ctattaatga agaagctgca gagtgggata ggctacatcc acaacaggca 660
        ggacctattc caccaggcca gataagagaa ccaaggggaa gtgatatagc aggaactact 720
 45     agtaccctgc aggaacaaat aacatggatg accagcaacc cacctatccc agtgggagaa 780
        atttataaaa gatggataat tctgggggtta aataaaatag tgagaatgta tagccctgtc 840
        agtattttag acataaaaca agggccaaaa gaacccttca gagattatgt ggataggttc 900
        tttaaaactt tgagagctga gcaagccaca caggaggtaa aaaactggat gacagacacc 960
        ttgttggtcc aaaatgcgaa cccagattgt aagaccatcc taagagcatt aggagcagga 1020
 50     gctacactag aagaaatgtt gacagcatgt caaggagtgg gaggacccag ccacaaagca 1080
        agagttttag ctgaggcaat gagccgggca acaggtacat cagcagccat aatgatgcag 1140
        aaaaacaatt ttaagggccc cgagaagaggt attaagtgtt tcaactgtgg caaggaagga 1200
        catctagcca gaaattgcag ggcccctagg aaaaaaggct gttggaaatg tggaaaggag 1260
        ggacatcaaa tgaaagactg cacagagaga caggctaatt ttttagggaa aatttggcct 1320
```

SEQ 55

```
tccaacaagg ggaggccagg gaattttctt cagaacaggc cagagccaac agccccaccc 1380
gcagagagct tcgggttcgg agaggagata gccccttccc tgaagcagga gccgagggaa 1440
aaggaatcac ctccattaac ctccctcaaa tcactctttg caacgaccc ctag       1494
```

<210> 48
<211> 4307
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=gag-pol fusion

<400> 48
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ttgaggccag ggggaaagaa aaaatataga atgaaacatt tagtatgggc aagcagggaa 120
ctggagagat ttgcacttaa ccctgacctc ttagaaacaa cagaaggttg tcagcaaata 180
atgagacagc tgcaaccatc tctccagaca ggaacagagg agattaaatc attatttaat 240
acagtagcaa ccctctattg tgtacatcaa aggatagagg taaaagacac caaagaagct 300
ctagaggaag tggaaaaaat acaaaagaac agtcagcaag aaacacagaa ggcagcaatg 360
ggtaaaggaa acagcagcca agttagccaa aattatccta tagtgcagaa tgcacaaggg 420
caagtggtac accagcccat atcacctagg actttaaatg catgggtaaa agtaatagaa 480
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<div align="center">SEQ 56</div>

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       ttaaagtaaa gcaactatgt aaactcctta gggggccaa  agcactaaca gacatagtac 2640
       cactgactga agaagcagaa ttagaattgg cagagaacag ggaaattcta aaagaacctg 2700
   5   tacatggagt ctactatgac ccatcaaaag aattaatagc agaattacag aaacaagggt 2760
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  25   tgaataaaga attaaagaaa attatagggc aggtcaggga tcaagctgaa cacctcaaga 3960
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       acagtgcagg ggaaagaata atagacataa tagcatcaga tatacaaact aaagaactac 4080
       aaaaacagat tataaaaatt caaaattttc gggtctatta cagggacagc agagacccca 4140
       tttggaaagg accagcaaaa ctactctgga aggtgaagg  ggcagtagta atacaggaca 4200
  30   atagtgagat aaaggtagta ccaagaagaa aagtaaaaat cattaaggat tatggaaaac 4260
       agatggcagg tggtgattgt gtggcaggta gacaggatga ggattag            4307

       <210> 49
       <211> 579
  35   <212> DNA
     · <213> Human immunodeficiency virus type 1

       <220>
     · <223> isolate=92NG003; gene=vif
  40
       <400> 49
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       tggaacagtt tagtaaaata tcatatgtat aaatctaaga aagctaagga ttggtttttat 120
       agacatcact atgaaagtag gcatccaaaa gtaagttcag aagtacacat cccactaggg 180
  45   gaggctagat tagtagtaag aacatattgg ggtctgcata caggagaaag agactggcac 240
       ttgggtcagg gggtctccat agaatggaag cagagaagat atagcacaca aatagatcct 300
       gacctagcag accaactgat tcacctgcat tattttaact gtttttcaga atcggccgta 360
       aggaaagcca tactaggaga agtagttaga cctaggtgtg aatatcaaac aggacataat 420
       caggtaggat cactacaata tttagcactc aaagcattag taacaccaac acagacaaag 480
  50   ccacctttac ctagtgttaa gaagttaaca gaagatagat ggaacgagcc ccagaagacc 540
       aggggccaca gagggagcca ttcaacgaat ggacactag               579

       <210> 50
       <211> 114
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SEQ 57

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<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=vpr

<400> 50
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<210> 51
<211> 2579
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=tat

<400> 51
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gcttgtaaca aatgttactg taaaatatgc tgctggcatt gccaattgtg ctttctgaac 120
aagggcttag gcatctccta tggcaggaag aagcggagac gccgacgagg aactcctcag 180
agtcaccagg atcatcaaaa tcctgtacca aagcagtgag tagtaatagt tagtatatgt 240
gatgcaatcc ttagaaatag ctgcaatagc aggactagta gtagcagcca tagcagccat 300
agttgtgtgg accatagaaa ataaagaaa caggagaaaa tagacaggtt acttgataga 360
ataagagaaa gagcagaaga tagtggcaat gagagtgaag gggacacaga ggaattggca 420
acacttgtgg acatggtgga ctttgatcct tgggttggtg ataatttgta gtgcctcaaa 480
taacttgtgg gtcacagtct attatggggt accagtgtgg gaagacgcag ataccccтct 540
attttgtgca tctgatgcta aagcatatag tactgaaaga cataatgtct gggccacaca 600
tgcctgtgta cccacagacc ccaacccaca agagataact ctggaaaatg taacagaaac 660
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tatgggcgcg gggtcaataa cgctgacggt acaggtcaga caattattgt ctggcatagt 1980
gcaacagcaa agcaatttgc tgagggctat agaggcgcag caacatctat tgcaactcac 2040
agtctggggc attaaacagc tccaggcaag agtcctggct gtagaaagat acctaaagga 2100
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SEQ 58

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      tcaacagctc ctagggattt ggggctgctc tggaaaactc atctgcacca ctaatgtgcc 2160
      ttggaacact agttggagta ataaatctta tgaggagatt tgggataaca tgacctggat 2220
      acaatgggaa agggaagtca gcaattacac acaacaaata tacagcctaa ttgaagaatc 2280
      gcagaaccag caggaaaaga atgaacaaga cttattggca ttggacaagt gggcaagttt 2340
      gtggaactgg tttgacataa caaaatggct atggtatata aaaatattta taatgatagt 2400
      aggaggttta ataggtttaa gaatagtttt tgctgtgctt ctatagtaa atagagttag 2460
      gcagggatac tcaccttttgt cattccagac ccttacccac caccagaggg aacccgacag 2520
      gcccgaaaga atcgaagaag gaggtggaga gcaagacaga gacagatcag tgcgcttag 2579
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      atggcaggaa gaagcggaga cgccgacgag gaactcctca gagtcaccag gatcatcaaa 60
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      gctgcaatag caggactagt agtagcagcc atagcagcca tagttgtgtg gaccatagaa 180
      aaataaagaa acaggagaaa atagacaggt tacttgatag aataagagaa agagcagaag 240
      atagtggcaa tgagagtgaa ggggacacag aggaattggc aacacttgtg gacatggtgg 300
      actttgatcc ttgggttggt gataatttgt agtgcctcaa ataacttgtg ggtcacagtc 360
      tattatgggg taccagtgtg gaagacgca gatacccctc tattttgtgc atctgatgct 420
      aaagcatata gtactgaaag acataatgtc tgggccacac atgcctgtgt acccacagac 480
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      aacatggtag aacagatgca tgaggatata atcagtttat gggatgaaag cctaaagcca 600
      tgtgtaaagc taacccctct ctgtgttacc ttaaactgta ctaatgtcaa ttgtaacagt 660
      aatgtgacca gcactgggaa cagtgctggg accaacgcta cgtgtaacat agaagaagca 720
      aacaacttaa aaaactgctc tttcaatata accacagaaa taagagataa gaaaaagaca 780
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      tcttttgacc cacttcccat acattattgt gctccagctg ggtttgcgat tttaaagtgt 960
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      catggaatta aaccagtggt atcaactcaa ttactactaa atggtagtct agcagaagga 1080
      gaaatagtaa ttagatctga aaacctcaca gacaatgcca aagtcataat agtacagctt 1140
      aataaaacta taggaattaa ttgtaccaga cccaacaaca atacaagaaa aagtataaga 1200
      atcggacctg gacaagcgtt ctatgcaaca ggtgaaataa taggacaaga atggcaggag 1260
      atgttacaga aggtacaggc acaactagaa caggtcttta caaaagtat aacctttaac 1320
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      ctcccatgta gataaaaaca aattgtgaga atgtggcaga gagtgggaca agcaatgtat 1500
      gcccctccca tcgcaggaga tattacatgt agatcaaaca ttacagggct attattaaca 1560
      agagatggtg gggttaataa tactggaaat gagaccttca gacctggagg aggagatatg 1620
      agggacaatt ggagaagtga attatataag tataaaatag taaaaattaa accactagga 1680
      atagcaccca ccaaggcaag gagaagagtg gtggagagag aaaaaggggc agttggactg 1740
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      ctgagggcta tagaggcgca gcaacatcta ttgcaactca cagtctgggg cattaaacag 1920
      ctccaggcaa gagtcctggc tgtagaaaga tacctaaagg atcaacagct cctagggatt 1980
      tggggctgct ctggaaaact catctgcacc actaatgtgc cttggaacac tagttggagt 2040
      aataaatctt atgaggagat ttgggataac atgacctgga tacaatggga aagggaagtc 2100
      agcaattaca cacaacaaat atacagccta attgaagaat cgcagaacca gcaggaaaag 2160
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SEQ 59

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     aatgaacaag acttattggc attggacaag tgggcaagtt tgtggaactg gtttgacata 2220
     acaaaatggc tatggtatat aaaaatattt ataatgatag taggaggttt aataggttta 2280
     agaatagttt ttgctgtgct ttctatagta aatagagtta ggcagggata ctcacctttg 2340
     tcattccaga cccttaccca ccaccagagg gaacccgaca ggcccgaaag aatcgaagaa 2400
     ggaggtggag agcaagacag agacagatca gtgcgcttag tgagcggatt cttagcactt 2460
     gcctgggacg acctgcggaa cctgtgcctc ttcagctacc accgattgag agacttagtc 2520
     ttgattgcag cgaggacagc agaactcctg acgcagca gtctccaggg actgagactg 2580
     gggtggggagg gcctcaaata tctgtggaat ctcctgttgt attggggtcg ggaactaaag 2640
     aatag                                                          2645
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<210> 53
<211> 230
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=vpu

<400> 53
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     gttgtgtgga ccatagaaaa ataaagaaac aggagaaaat agacaggtta cttgatagaa 120
     taagagaaag agcagaagat agtggcaatg agagtgaagg ggacacagag gaattggcaa 180
     cacttgtgga catggtggac tttgatcctt gggttggtga taatttgtag            230
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<210> 54
<211> 2538
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=env

<400> 54
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     gtaccagtgt gggaagacgc agatacccct ctattttgtg catctgatgc taaagcatat 180
     agtactgaaa gacataatgt ctgggccaca catgcctgtg tacccacaga ccccaaccca 240
     caagagataa ctctggaaaa tgtaacagaa acttttaaca tgtggaaaaa taacatggta 300
     gaacagatgc atgaggatat aatcagttta tgggatgaaa gcctaaagcc atgtgtaaag 360
     ctaaccccctc tctgtgttac cttaaactgt actaatgtca attgtaacag taatgtgacc 420
     agcactggga cagtgctgg gaccaacgct acgtgtaaca tagaagaagc aaacaactta 480
     aaaaactgct ctttcaatat aaccacagaa ataagagata gaaaaagac agaatatgcg 540
     ctttctata gacttgatgt ggtaccaatc gatggtaata ataatgtctc aaataactat 600
     aggctaataa attgtaatgt ctcaaccatt aaacaagctt gtccaaggt gtctttgac 660
     ccacttccca tacattattg tgctccagct gggtttgcga tttaaagtg taggggtaag 720
     aatttcactg gaacaggaca atgtaaaaat gtcagttcag tacaatgtac acatggaatt 780
     aaaccagtgg tatcaactca attactacta aatggtagtc tagcagaagg agaaatagta 840
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     ataggaatta attgtaccag acccaacaac aatacaagaa aaagtataag aatcggacct 960
     ggacaagcgt tctatgcaac aggtgaaata ataggacaag aatggcagga gatgttacag 1020
     aaggtacagg cacaactaga acaggtcttt aacaaaagta taacctttaa ctcatccgca 1080
     ggaggggacc tagaaattac aacacatagt tttaattgta gaggagaatt tttctattgt 1140
     aatacatcag gattgtttaa tgaatcagga gggaatgata ccactatcac actcccatgt 1200
     aagataaaac aaattgtgag aatgtggcag agagtgggac aagcaatgta tgcccctccc 1260
```

<div align="center">SEQ 60</div>

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        ggggttaata atactggaaa tgagaccttc agacctggag gaggagatat gagggacaat 1380
        tggagaagtg aattatataa gtataaaata gtaaaaatta aaccactagg aatagcaccc 1440
        accaaggcaa ggagaagagt ggtggagaga ggaaaaaggg cagttggact gggagctgtc 1500
5       ttccttgggt tcttaggagc agcaggaagc actatgggcg cggggtcaat aacgctgacg 1560
        gtacaggtca dacaattatt gtctggcata gtgcaacagc aaagcaattt gctgagggct 1620
        atagaggcgc agcaacatct attgcaactc acagtctggg gcattaaaca gctccaggca 1680
        agagtcctgg ctgtagaaag atacctaaag gatcaacagc tcctagggat ttggggctgc 1740
        tctggaaaac tcatctgcac cactaatgtg ccttggaaca ctagttggag taataaatct 1800
10      tatgaggaga tttgggataa catgacctgg atacaatggg aaagggaagt cagcaattac 1860
        acacaacaaa tatacagcct aattgaagaa tcgcagaacc agcaggaaaa gaatgaacaa 1920
        gacttattgg cattggacaa gtgggcaagt ttgtggaact ggtttgacat aacaaaatgg 1980
        ctatggtata aaaaatatt tataatgata gtaggaggtt aataggttt aagaatagtt 2040
        tttgctgtgc tttctatagt aaatagagtt aggcagggat actcacctt gtcattccag 2100
15      acccttaccc accaccagag ggaacccgac aggcccgaaa gaatcgaaga aggaggtgga 2160
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20      attaatttga ttgatacaat agcaatagca gtagctaact ggacagatag ggttatagaa 2460
        gtagcacaag gagcttgtag agctattctc aacatatta gaaggataag acaaggcttg 2520
        gaaagagctt tgctataa                                              2538
```

<210> 55
<211> 621
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=92NG003; gene=nef

<400> 55
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        gcaatcacaa gcagcaatac agcacaaact aatcctgatt gtgcctggct agaagcacaa 180
        caggagaatt cagaggtagg ctttccagtc agacaacagg tacctttgag accaatgact 240
        tataaggctg cctttgatct cagcttcttt ttaaaagaaa aggggggact ggatgggcta 300
        atttactcta gaaaagaca agacatcctt gacctatggg tctataatac acaaggatac 360
        ttcccagatt ggcagaacta cactccaggg ccaggactA gattcccact gacatttcgg 420
        tggtgcttca aactagtacc aatggatcca gcagagatag gaagccaa taaggagag 480
        aacaacagtt tattacaccc tatctgccaa catggcctgg aagatgcgga cagagaagtg 540
        ctggtatgga gatttgacag tagcctagca cggagacaca tagcccgaga caacatccg 600
        gagtactata aggactgctg a                                           621
```

<210> 56
<211> 1438
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=gag

<400> 56
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SEQ 61

132   *VB*

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            gctagaacga ttcgcagtta atcctggcct tttagagaca tcagaaggct gtagacaaat  180
            actggaacag ctacaaccag cccttaagac gggatcagaa gaacttagat cattatataa  240
            tacagtagca accctctatt gtgtacatca aaagatagat gtaaaagaca ccaaggaagc  300
      5     tttagaaaag atagaggaag agcaaaacaa agtaagaaaa aggcacagca agcagcagct  360
            aacacaggaa acaacagcca ggtcagccaa aattacccta tagtgcagaa ccttcagggg  420
            caaatggtac accaggccat atcacctaga actttaaatg catgggtaaa agtagtagaa  480
            gagaaggctt ttagcccaga agtaataccc atgttttcag cattatcaga aggagccacc  540
            ccacaagatt taaacaccat gctaaacaca gtggggggac atcaagcagc tatgcaaatg  600
      10    ttaaaagaaa ccatcaatga ggaagctgca gaatgggaca gagtacatcc agtgcatgca  660
            ggacctatcc caccaggcca gatgagggaa cctaggggaa gtgatatagc tggaactact  720
            agtacccttc aggaacaaat acaatggatg acaagcaacc cacctgtccc agtgggagaa  780
            atttataaaa gatggatcat cctaggatta aataaaatag taagaatgta tagccctacc  840
            agcattctgg gcataagaca aggaccaaag gaacccttta gagactatgt agatcgattt  900
      15    tataaaactc taagagcaga gcaaacttca caggatgtaa aaaattggat gacagaaacc  960
            ttgttggtcc aaaatgcgaa cccagattgc aaaaccattt taaaagcatt gggaccagca 1020
            gctacactag aagaaatgat gacagcatgt caggggagtgg ggggacccgg ccataaagca 1080
            agagttttgg cagaagcaat gagccaagta acaaattcag gtaccataat gatgcagaga 1140
            ggcaatttta ggaaccaaag aaagactatt aagtgtttca attgtggcaa agaagggcac 1200
      20    atagccaaaa attgcagggc ccctaggaaa aagggctgct ggaaatgtgg aaaggaagga 1260
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            cacaagggaa ggccagggaa tttccttcag agcagaccag agccaacagc cccaccagca 1380
            gagagcttca ggtttgggga agaggtaaca actccctctc agaaacagga gccgatag   1438


      25    <210> 57
            <211> 3012
            <212> DNA
            <213> Human immunodeficiency virus type 1


      30    <220>
            <223> isolate=93BR029; gene=pol; note=NH2-terminus
                  uncertain


            <400> 57
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            ctctcagaaa caggagccga tagacaagga gatgtatcct ttggcttccc tcagatcact  180
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            gataccggag cagatgatac agtattagaa gaaataaatt taccaggaag atggaaacca  300
      40    aaaatgatag ggggaattgg aggttttatc aaagtaagac agtatgatca aataccccata  360
            gaaatttgtg gacgtaaagc tacaggtaca gtattagtag gacctacacc tgtcaacata  420
            attggaagaa atctgttgac tcagattggc tgcactttaa attttcccat tagtcctatt  480
            gaaactgtac cagtaaaatt gaagccagga atggatggcc caaggttaa caatggcca  540
            ttgacagaag aaaaaataaa agcattaaca gaaatatgta cagaaatgga aaaagaagga  600
      45    aaaatttcaa aaattgggcc cgaaaatcca tacaatactc cagtatttgc cataaagaaa  660
            aaagatagta ctaaatggag aaaattagta gatttcagag aacttaataa gagaactcaa  720
            gacttctggg aagttcagtt aggggatacca catcccgcag ggttaaagaa gaaaaaatca  780
            gtaacagtac tggatgtggg tgatgcatat tttttcagttc cattagataa agacttcagg  840
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                                   SEQ 62
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ctgccagaaa aagacagctg gactgtcaat gacatacaga agttagtggg aaaattgaat 1260
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aacagggaga ttctaaaaga accagtacat ggagtgtatt atgacccctc aaaagactta 1440
atagcagaaa tacagaaaca ggggcaaggc caatggacat atcaaattta tcaagagcca 1500
tataaaatt tgaaaacagg aaagtatgca aggatgaggg gtgcccacac taatgatgta 1560
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gttgtccccc taacggacac aacaaatcag aaaactgagt tacaagcaat tcatctagct 1920
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gaacaagtag acaaattagt cagttctgga atcaggaaag tactatttt agatggaata 2160
gataaggccc aagaagaaca tgagaaatat cacaataatt ggagagcaat ggctagtgac 2220
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agggatcagg ctgaacatct taagacagca gtacaaacgg cagtattcat ccacaatttt 2700
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gaaggggcag tagtaataca agataatagt gacataaaag tagtgccaag aagaaaagta 2940
aagatcatta gggattatgg aaaacagatg gcaggtggtg attgtgtggc aggtagacag 3000
gatgaggatt aa                                                   3012
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<210> 58
<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=vif

<400> 58

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agacatcact ttgaaagcag gcatccaaga gtaagttcag aagtacatat cccactagag 180
gaagctaaat tagtaataac aacatattgg gggctgcata caggagaaag agattggcat 240
ctgggtcagg gagtctccat agaatggagg caggggaggt ataggacaca aatagaccct 300
ggcctggcag accaactgat ccatatatat tattttgatt gtttttcaga atctgccata 360
aggaaagcca tattaggaca tagaattagc cctaggtgtg attatcaagc aggacataac 420
aaggtaggat ctctacagta cttggcacta acagcattaa taaaaccaaa aaagagaaag 480
ccacctttgc ccagtgttaa gaaactgaca gaggatagat ggaacaagcc ccagaagacc 540
aaggaccaca gagggagcca tacaatgaat ggacactag                      579
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<210> 59
<211> 291

SEQ 63

<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=vpr

<400> 59
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agcttaggac aacatatcta tgaaacttat ggggatactt gggcaggagt ggaagccata 180
ataagaattc tgcaacaact gctgtttatt catttcagaa ttgggatgtca acatagcaga 240
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<210> 60
<211> 2601
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=tat

<400> 60
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aagggcttag gcatctccta tggcaggaag aagcggagac agcgacacag aactcctcaa 180
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aatgtcatat ttgttagtaa taggtttagc agcattaata gcagcactaa taatagcaat 300
agttgtgtgg actatagcat atatagaata tagggaacta gtaaggcaaa gaaaaataaa 360
taggttatat aaaagaataa gagaaagagc agaagacagt ggcaatgaga gtgaggggga 420
tgcagaggaa ttggcagcac ttggggaaat ggggcctttt attcctgggg atattgataa 480
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tctgggctac acatgcctgt gtacccacag atcccaatcc acaagaagta gttctggaaa 660
atgtaacaga aaattttgat atgtggaaaa ataacatggt agaacaaatg catacagata 720
taatcagttt atgggatcaa agcctgaagc catgtgtgaa gttaacccca ctctgtgtta 780
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cttgtccaaa ggtatcttgg gatccaattc ccatacatta ttgtgctcca gctgggtatg 1080
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gaaaaagtat accaatagga ccaggacgag catttttatac aacaggagaa ataataggag 1380
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agaataatca gacggaggag accttcagac ctggggagg aaatatgaaa gacaactgga 1800
gaagtgaatt atataaatat aaagtagtag aaattgagcc attaggagta gcacccacca 1860
aggcaaaaag acaagtggtg aagagagaaa aaagagcagt gggaatggga gctttgttcc 1920

SEQ 64

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ttgggttctt gggagcagca ggaagcacta tgggcgcagc gtcaataacg ctgacggcac 1980
aggccagaca attattgtct ggcatagtgc aacagcagaa taatttgctg agggctattg 2040
aagcgcaaca gcatctgttg cagctcacag tctggggcat aaacagctc caggcaagaa 2100
tcctggctgt ggaaagatac ctaaaggatc aacagctcct agggctttgg ggctgctctg 2160
gaaaactcat ctgcaccact gatgtgccct ggaactctag ttggagtaac aaatctcagg 2220
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acgaaatata taggttaatt gaagagtcgc agaaccagca ggaaaagaat gaacaagaat 2340
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ctgtgctttc tatagtaaat agagttagga agggatactc acctttgtca ttacagaccc 2520
gcttcccaag cccaagggaa cccgacaggc ccgaaggaat cgaagaagga ggtggagagc 2580
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<210> 61
<211> 2652
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=rev

<400> 61
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ataggtttag cagcattaat agcagcacta ataatagcaa tagttgtgtg gactatagca 180
tatatagaat atagggaact agtaaggcaa agaaaaataa ataggttata taaaagaata 240
agagaaagag cagaagacag tggcaatgag agtgaggggg atgcagagga attggcagca 300
cttggggaaa tgggcctttt tattcctggg gatattgata atctgtaatg ctgaaaactt 360
gtgggtcaca gtctattatg gggtacctgt gtggaagaa gcaaccacta ctttattctg 420
tgcatcagat gctaaagcat atgaaaaaga agcacataat gtctgggcta cacatgcctg 480
tgtacccaca gatcccaatc cacaagaagt agttctggaa aatgtaacag aaaattttga 540
tatgtggaaa ataacatgg tagaacaaat gcatacagat ataatcagtt tatgggatca 600
aagcctgaag ccatgtgtga agttaacccc actctgtgtt actttacgtt gtagtaatgc 660
cactaccaac agtactcaaa acgacaccct gaggaagag ccaggggcaa tacaaaactg 720
ttctttcaat atgaccacag aagtaagaga taagcagctg aaagtacatg cactttttta 780
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gaagagagaa aaaagagcag tgggaatggg agctttgttc cttgggttct gggagcagc 1800
aggaagcact atgggcgcag cgtcaataac gctgacggca caggccagac aattattgtc 1860
tggcatagtg caacagcaga ataatttgct gagggctatt gaagcgcaac agcatctgtt 1920
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SEQ 65

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gcagctcaca gtctgggggca ttaaacagct ccaggcaaga atcctggctg tggaaagata 1980
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tgatgtgccc tggaactcta gttggagtaa caaatctcag gagaagatct gggggaacat 2100
gacctggatg gagtgggaaa aagagattag caattactca aacgaaatat ataggttaat 2160
tgaagagtcg cagaaccagc aggaaaagaa tgaacaagaa ttattggcat tggacaaatg 2220
ggcaagtctg tggaattggt ttgacatatc aaaatggctg tggtatataa aaatattcat 2280
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acccgacagg cccgaaggaa tcgaagaagg aggtggagag ccaggcaaag acagatccgt 2460
gagattagtg aacggattct tagctcttgt ctgggacgac ctgaggaacc tgtgcctctt 2520
cagctaccgc cacttgagag acttcatatt aattgcagcg aggattgtgg acaggggact 2580
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<210> 62
<211> 2529
<212> DNA
<213> Human immunodeficiency virus type 1


<220>
<223> isolate=93BR029; gene=env


<400> 62
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cctgtgtgga agaagcaac cactacttta ttctgtgcat cagatgctaa agcatatgaa 180
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caaatgcata cagatataat cagtttatgg gatcaaagcc tgaagccatg tgtgaagtta 360
accccactct gtgttacttt acgttgtagt aatgccacta ccaacagtac tcaaaacgac 420
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agagataagc agctgaaagt acatgcactt ttttataggc ttgatatagt accaatcagc 540
aatgataata gtagcaatga taatagtagc agagaataca ggctaataaa ttgtaatacc 600
tcaacccctta cacaggcttg tccaaaggta tcttgggatc caattcccat acattattgt 660
gctccagctg ggtatgcgat tctaaagtgt aatgataaaa aattcaatgg gacggggcca 720
tgcaggaatg tcagcacagt acaatgtaca catggaatta aaccagtggt atcaactcaa 780
ttgttgttaa atggcagcct agcagaaaaa gatataataa tcagatctca aaatatctca 840
gataatgcaa aaaccataat agtacaactt aatgtatctg tgccgattaa ttgtacaaga 900
cccaacaaca atacaagaaa aagtatacca ataggaccag gacgagcatt ttatacaaca 960
ggagaaataa taggagacat cagaaaggca cattgtaacg ttagtggaac aaaatggaat 1020
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tttaactcat cctcaggagg ggacctagaa attacaatgc atagttttaa ttgtagagga 1140
gaattttct actgcaatac atcaggactg tttaatgaca cagtagacaa tggcactatc 1200
actctcccat gtcgaataaa gcaaattgta aatatgtggc aggaagtggg gcgagcaatg 1260
tatgccgctc ccattgcagg aaacattacc tgtagctcaa atattacagg tctactattg 1320
acaagagatg gtggtcagaa taatcagacg gaggagacct tcagacctgg gggaggaaat 1380
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atgggagctt tgttccttgg gttcttggga gcagcaggaa gcactatggg cgcagcgtca 1560
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cagctccagg caagaatcct ggctgtggaa agatacctaa aggatcaaca gctcctaggg 1740
ctttgggggct gctctggaaa actcatctgc accactgatg tgccctggaa ctctagttgg 1800
agtaacaaat ctcaggagaa gatctggggg aacatgacct ggatggagtg ggaaaaagag 1860
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SEQ 66

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attagcaatt actcaaacga aatatatagg ttaattgaag agtcgcagaa ccagcaggaa 1920
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ttgtcattac agacccgctt cccaagccca agggaacccg acaggcccga aggaatcgaa 2160
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<210> 63
<211> 621
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=93BR029; gene=nef

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ggggcaatta caagcagcaa tactggagct aataatcctg acttggcctg gctggaggca 180
caagaggaag aggaagtagg ctttccagtc agacctcagg tacctttaag accaatgact 240
tataagggag ctcttgatct cagtcacttt ttaaaagaaa aggggggact ggaagggtta 300
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aacaactgct tgctacaccc catgagccaa catggaatgg aggatgaaga cagagaaata 540
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<210> 64
<211> 1503
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CY032.3; gene=gag

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ttggaaagat tcgcacttaa ccctggcctt ttagaaacag cagaaggatg tcaacaatta 180
atggaacagt tacaatcaac tctcaaaaca ggatcagaag aacttagatc attatataat 240
actataacaa ccctctggtg cgtacatcaa agaatagatg tacaagacac caggaagct 300
ttagataaaa tagaggaaat acaaagtaag agcaagcaaa agacacagca ggcagcagct 360
gccgcaggag gtagcagcaa tgtcagccaa aattacccta tagtgcaaaa tgcacaaggg 420
caaatggtac atcagagcat ttcacctaga actttgaatg catgggtaaa agtaatagaa 480
gaaaaggctt tcagcccaga agtaataccc atgttctcag cattatcaga gggagccacc 540
ccacaagatt tgaacatgat gctaaatata gtgggggggac accaggcagc aatgcaaatg 600
ttaaaagata ccatcaatga ggaagctgca gactgggaca ggacacatcc agtacatgca 660
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SEQ 67

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gggcctattc caccaggcca gatgagagaa ccaaggggaa gtgatatagc aggaactact 720
agtacccttc aagaacaaat aggatggatg acaagcaacc cacctgtccc agtgggagaa 780
atctataaaa gatggataat cttggggtta aataaaatag taagaacgta tagccccatt 840
agcatcttgg acataagaca aggaccaaaa gaacccttca gagattatgt agataggttc 900
tttaaatgtc tcagagcaga acaagctacc caggaggtga aaaattggat gacagaaacc 960
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ggacatcaaa tgaaagactg cactgagaga caggctaatt ttttagggag aatgtggcct 1320
tccagcaaag ggaggccagg aaattttctt cagaacaggc cagagccaac agccccgccc 1380
gcggaatgct tagagaggaa agaggagaca acctcctctc tgaagcagga accgagggac 1440
aaggaactat atcctttaac ttccctcaaa tcactctttg cagcgaccc cttgtcacaa 1500
taa                                                                  1503

<210> 65
<211> 3009
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CT032.3; gene=pol

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gccagagcca acagccccgc ccgcggaatg cttagagagg aaagaggaga caacctcctc 120
tctgaagcag gaaccgaggg acaaggaact atatccttta acttccctca aatcactctt 180
tggcagcgac cccttgtcac aataaaacta gggggacaga taagggaggc tctttttagat 240
acaggagcag atgatacagt attagaagaa ataaatttgc caggaaaatg gaagccaaaa 300
atgatagggg gaatcggagg ttttatcaaa gtaagacaat gatcagat acctatagaa 360
atttgtggaa aaaaggccat aggcacagtg ttagtaggac ctacacctgt caacataatt 420
ggacgaaaca tgttgactca gcttggttgt actttaaatt ttccaattag tcctattgaa 480
actgtaccag taaaattaaa gccaggaatg gatggcccaa aggttaaaca atggccattg 540
acagaagaaa aaataaaagc cttaacagag atatgtacag acatggaaaa ggaaggcaag 600
atttcaaaaa ttgggcctga aaatccatac aatactccaa tatttgctat aaagaaaaaa 660
gacagcacta aatggagaaa attagtagat ttcagagaac tcaataaaag aactcaggac 720
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cctaagttta gattacccat acaaaaggaa acatgggaca catggtggac agaatattgg 1680
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            gtctccctat ctgaaacaac aaatcagaag actgaattac aagcaattta cttagctttg 1920
            caggattcag gatcagaagt aaacatagta acagactcac agtatgcaat aggaatcatt 1980
    5       caagcacaac cagatagaag tgaatcagat ttagttaatc aaataataga gcagttaata 2040
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            aatctgccat cagtggtagc aaaagagata gtagctagct gtaataaatg tcagctaaaa 2280
    10      ggggaagcca tgcatggaca agtggactgt agtccaggga tatggcagtt agattgtaca 2340
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    15      agccaaggag tagtggaatc tatgaataaa gaattaaaga aaatcatagg gcaggtcagg 2640
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            <210> 66
    25      <211> 579
            <212> DNA
            <213> Human immunodeficiency virus type 1


            <220>
    30      <223> isolate=94CT032.3; gene=vif


            <400> 66
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    35      agacatcact atgaaagtag cacccaaaa gtaagttcag aagtacatat cccactaggg 180
          · gaggctagat tagtagtaag aacatattgg ggtctgcagc caggggaaca agactggcac 240
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            aggaaagcca tattaggaca tagagttagt cctaggtgtg aatatcaagc aggacataat 420
    40      aaggtaggat ccttacaata cctggcacta gcagcattaa tatccccaaa aaagacaaag 480
            ccacctttgc ctagtgttaa gaaactagtg gaggatagat ggaacaagcc ccagaagacc 540
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            <210> 67
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            <212> DNA
            <213> Human immunodeficiency virus type 1


            <220>
    50      <223> isolate=94CY032.3; gene=vpr


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SEQ 69

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        ataggcatta ctcctcaaag gagaagaggc aggggatgga gccagtag         288


    <210> 68
    <211> 2643
    <212> DNA
    <213> Human immunodeficiency virus type 1

    <220>
    <223> isolate=94CT032.3; gene=tat


    <400> 68
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        aaaggcttag gcatctccta tggcaggaag aagcggaaac atcgacgagg atctcttcaa 180
        ggcagcaagg gccatcaaaa tcttatacca aagcagtaag tattaagtat atgtaatgtt 240
        attctgggaa atctgggcaa tagtaggact ggtagtagcg ctaattatag taatagtagt 300
        gtggacttta gtatttatag aatataagaa attgagaagg caaaggagaa tagacagctt 360
        gtacaataga ataagagaaa gagcagaaga cagtggcaat gagagtgatg gggatgcaga 420
        ggaattatcc acacttgtgg gaatggggaa cttttgatcct tgggttggtg ataatctgta 480
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        cttggaactc tagttggagt aataaatctt ataatgatat atgggacaat atgacctggt 2280
        tgcaatggga taaagaaatt aacaattaca cacaaataat atatgggtta cttgaagaat 2340
        cacagaacca gcaggaaaag aatgagcaag acttattggc cttggacaag tgggcaagcc 2400
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                                    SEQ 70

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acaggcccgg aggaacagaa gaagaaggtg gcgagcaaga cagaagcaga tccattcgct 2640
tag                                                               2643
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<210> 69
<211> 2688
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CT032.3; gene=rev

<400> 69
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atagtaggac tggtagtagc gctaattata gtaatagtag tgtggacttt agtatttata 180
gaatataaga aattgagaag gcaaaggaga atagacagct tgtacaatag aataagagaa 240
agagcagaag acagtggcaa tgagagtgat ggggatgcag aggaattatc cacacttgtg 300
ggaatgggga actttgatcc ttgggttggt gataatctgt agtgcctcaa caacttgtg 360
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atcagaagct aaagcatatg agaaagaagt acataatatc tgggctacac atgcctgtgt 480
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gtggaaaaat gacatggtag aacagatgca tgaggatata atcagtttat ggaatgaagg 600
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gctccaggca agagtcctgg ctctggaaag ctacctaaag gatcaacagc tcctaggaat 2040
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gaatgagcaa gacttattgg ccttggacaa gtgggcaagc ctgtggaatt ggtttagcat 2280
aacaaatgg ctatggtata aaaaatatt tataatgata gtaggaggct tgataggctt 2340
aagaataatt tttgctgtgc tttctatagt aaatagagtt aggcagggat actcaccttt 2400
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                                SEQ 71

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agaagaaggt ggcgagcaag acagaagcag atccattcgc ttagtgaacg gattcttgcc 2520
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actcttaatt gtagcgagga ctgtggaact tctgggggata aggggggtggg aagccctcaa 2640
gtatctgtgg aacttcctgc tgtattgggg acaggagcta aagaatag          2688
```

<210> 70
<211> 246
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CT032.3; gene=vpu

<400> 70
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agcttgtaca atagaataag agaaagagca gaagacagtg gcaatgagag tgatggggat 180
gcagaggaat tatccacact tgtgggaatg gggaactttg atccttgggt tggtgataat 240
ctgtag                                                    246
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<210> 71
<211> 2571
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CY032.3; gene=env

<400> 71
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gtacctgtgt ggagagacgc agagaccacc ctattttgtg catcagaagc taaagcatat 180
gagaaagaag tacataatat ctgggctaca catgcctgtg tacccacaga ccccaaccca 240
caagaagtag ctctgataaa tgtaacagag aactttaaca tgtggaaaaa tgacatggta 300
gaacagatgc atgaggatat aatcagttta tggaatgaag cctaaaacc atgtgcaaag 360
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ggcactgtga ttaagaagg aataaaaac tgctctttcg atataaccac agaaataagg 480
gataagaaga agaaagaata tgcgctttc tatagaattg atatagtgcc aattaatgct 540
agagtgccaa ttaatggtag aataggaat aatagtacag aagagtatat gttaataaat 600
tgtaacgcct caaccattaa acaggcttgc ccaaaggtgt cttttgagcc aattcccata 660
cattattgtg ccccagctgg ttttgcaatt ttaaagtgta atgagaaaaa tttcactgga 720
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acaataaaat ttgctccacc cgtaggaggg gacctagaaa ttacaacaca tagctttaat 1140
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aatggtacaa acattacaag tacagattct acaaattcaa ccatcacact ccaatgcaga 1260
ctaaaacaat ttgtaaggat gtggcaggaa gtggggcaag caatgtacgc ctcccccatt 1320
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actaataata ctgagatctt cagacctgga ggaggagaca tgagggacaa ttggagaagt 1440
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SEQ 72
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        ctggaaagat ttgcgcttaa ccctggcctt ttagaaacat cagaaggctg taaacaaata 180
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SEQ 73

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        cctattgcac caggccaaat gagagaacca aggggaagtg atatagcagg aactactagt 720
        accctccaag aacagatagc atggatgaca agtaatcccc ctattccagt gggagacatc 780
  10    tataaaagat ggataattct ggggttaaat aaaatagtaa gaatgtatag ccctgtcagc 840
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  25    <212> DNA
        <213> Human immunodeficiency virus type 1


        <220>
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        gaagcaggag tcgaaagaca gggaagcctt aacttccctc aaatcactct tggcagcga 180
  35    ccccttgtct caataaaggt aggggccaa ataaaggagg ctctcttaga cacgggagca 240
      · ggtgatacag tattagaaga aataaatttg ccaggcaaat ggaaaccaaa aatgatagga 300
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         <212> DNA
         <213> Human immunodeficiency virus type 1


         <220>
35       <223> isolate=96ZM651.8; gene=vif


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40       agacatcatt atgaaagcag acatccaagg gtaagttcag aagtacatat cccattaggg 180
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50       <211> 291
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SEQ 75

146

B

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<213> Human immunodeficiency virus type 1

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SEQ 76

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SEQ 77

j4̸8̸   *β*

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     <212> DNA
15   <213> Human immunodeficiency virus type 1

     <220>
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     gtacctgtgt ggaaagaagc aaaaactact ctattctgtg catcagatgc taaatcatat 180
     gagaaagaag tgcataatgt ctgggctaca catgcctgtg tacccacaga ccccaaccca 240
40   caagaaatag ttttgggaaa tgtaacagaa aattttaaca tgtggaaaaa tgacatggtg 300
     gatcagatgc atgaggatat aatcagttta tgggatcaaa gcctaaagcc atgtgtaaag 360
     ttgaccccac tctgtgtcac tttaaattgt acagaggtta atgttaccag aaatgttaat 420
     aatagcgtgg ttaataatac cacaaatgtt aataatagca tgaatggaga catgaaaaat 480
     tgctctttca acataaccac agaactaaaa gataagaaaa agaatgtgta tgcactttt 540
45   tataaacttg atatagtatc acttaatgag actgacgact ctgagactgg caactctagt 600
     aaatattata gattaataaa ttgtaatacc tcagccctaa cacaagcctg tccaaaggtc 660
     tcttttgacc caattcctat acattattgt gctccagctg gttatgcgat tctaaagtgt 720
     aataataaga cattcaatgg gacaggacca tgccataatg tcagcacagt acaatgtaca 780
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50   gggataataa ttagatctga aaatctgaca aacaatgtca aaacaataat agtacatctt 900
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     cattgtaaca ttagtaggac taactggact aagactttac gagaggtaag gaacaaatta 1080
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                              SEQ 78
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        aagagtgcta ttagtctact tgataccata gcaatagcag tagctgaagg aacagatagg 2520
        attatagaat taatacaagg aatttgtaga gctatccgca acgtacctag aagaataaga 2580
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        <210> 81
        <211> 621
        <212> DNA
  30    <213> Human immunodeficiency virus type 1


        <220>
        <223> nef


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        ggagcactta caagcagcaa cacaagtacc actaatgctg cttgtgcctg gctggaagca 180
        caagaggagg aagaagttgg ctttccagtc agacctcagg tgcctttaag accaatgact 240
  40    tataaggcag cagtcgatct cagcttcttt ttaaaagaaa aggggggact ggaagggtta 300
        atttactcta agaaaaggca agaaatcctt gatttgtggg tctatcacac acaaggcttc 360
        ttccctgact ggcaaaacta cacaccggga ccaggggtca gatatccact gacctttgga 420
        tggtgcttca gctagtgcc agttgatcca ggggaagtag aagaggccaa cgaaggagaa 480
        aacaactgtc tgctacaccc tatgagccag caaggaatgg atgatgatca cagagaagta 540
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        gagtattaca aagactgctg a                                          621


        <210> 82
        <211> 1496
  50    <212> DNA
        <213> Human immunodeficiency virus type 1


        <220>
        <223> isolate=96ZM751.3; gene=gag
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SEQ 79

<400> 82
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atacaacagc tacaaccagc tctccagaca ggaacagagg aacttaggtc attatataat 240
acagtagcaa ctctctattg tgtacatgaa aagataaagg tacgagacac caaggaagcc 300
ctagacaaga tagaggaaga acaaaacaaa agtcaacaaa aaatacaaaa aacagaagcg 360
actggcggaa aggtcagtca aaattatcct atagtgcaga tctccaagg gcaaatggta 420
caccaggcta tatcacctag aactttgaat gcatgggtaa aagtaataga ggagaagggt 480
ttcaacccag aggtaatacc catgtttaca gcattatcag aaggagccac cccacaagat 540
ctaaacacca tgttaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
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gcaccaggcc aaataagaga accaagggga agtgacatag caggaactac tggtaccctt 720
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agatggataa ttctgggggtt aaataaaata gtaagaatgt acagccctgt cagcattctg 840
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gccctaaaag aattgttaaa tgtttcaact gtggcaggga agggcatata gccaggaatt 1200
gcagggctcc tgggaaaaaa ggctgttgga aatgtggaaa ggaaggacac caaatgaaag 1260
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<210> 83
<211> 3017
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96AM751.3; gene=pol

<400> 83
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atcactcttt ggcagcgacc ccttgtctca ataaaagtag ggggtcagat aaaggaggct 240
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tggccattga cagaagaaaa aataaaagca ttaacagcaa tttgtgaaga aatggaaaag 600
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aaaaagaagg acagtactaa gtggagaaaa ttagtagatt tcagggaact caataaaaga 720
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SEQ 80

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     gagcccccat ttctttggat ggggtatgaa ctccatcctg acaaatggac agtacagcct 1200
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     cagagagcag ggaaattcta aaagaaccag tacatggagt atattatgac ccatcaaaag 1440
     acttaatagc tgaaatacag aaacaagggc atgaccaatg gacatatcaa gtttaccaag 1500
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     gaaagattcc taaatttagg ctacccattc aaaaagaaac atgggagaca tggtggacag 1680
     actattggca agccacctgg attcctgagt gggagtttgt taatactccc ccctagtaa 1740
     aattatggta ccagctggag aaagaaccca tagcaggagc agaaacttac tatgtagatg 1800
     gagcagccaa tagggaaact aaaataggaa aagcagggta tgttactgac agaggaaggc 1860
     aaaaaattgt tactctaact gaaacaacaa atcaaaagac tgaattacaa gcaattcagt 1920
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<210> 84
<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96ZM751.3; gene=vif

<400> 84
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     agacatcatt atgaaagcag acatccaaaa ataagttcag aagtacacat cccattaggg 180
     gatgccaaat tagtaataaa aacatattgg gggctgcatc caggggaaag agaatggcat 240
     ttgggtcatg gagtctccat agaatggaga ttgagaagat acagcacaca gtagaccct 300
     ggcctggcag accagctaat tcatatgcat tattttaatt gtttgcaga ctctgccata 360
     agaaaagccc tactaggaca tatagttatt cctaggtgtg attatcaagc aggacataat 420
     aaggtaggat ccctacaata cttggcactg acagcattga taaaaccaaa aaagataaag 480
     ccacctttac ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaaaacc 540
     aagggccgca gagggaacca tataatgaat gggcactag                          579
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                                    SEQ 81

<210> 85
<211> 291
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96ZM751.3; gene=vpr

<400> 85
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gagcttttag aggagctcaa gcaggaagct gtcagacact ttcctagaac atggctccat 120
aacttaggac aacatatcta ccaaacctac ggggatactt ggacgggggt tgaagctcta 180
ataagaatac tgcaacaact actgtttatt catttcagaa ttggatgcca acatagcaga 240
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<210> 86
<211> 2646
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96AM751.3; gene=tat

<400> 86
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aaaggcttag gcatttccta tggcaggaag aagcggagac aacgacgaag cgctcctcca 180
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aaatggtttt ggaaaatgta acagaaaagt ttaacatgtg gaaaataac atggtggatc 720
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SEQ 82

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<210> 87
<211> 2631
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
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gtagattata gaataggagt aggagcatta atagcagcac taatcatagc aatagctgtg 180
tggatcatag tatatataga atatagaaaa ttgtcaagac aaagaaaaat agaccggtta 240
attaaaagaa ttagagaaag ggcagaagac agtggcaatg agagtgaagg ggataatgag 300
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aactacttta ttttgtgcat cagatgctaa agcatatgag acagaagtgc ataatgtttg 480
ggctacacat gcctgtgtac ccacagaccc caacccacaa gaaatggttt tggaaaatgt 540
aacagaaaag tttaacatgt gggaaaataa catggtggat cagatgcatg aggatataat 600
cagtttatgg gaccaaagcc taaagccatg tgtaaagttg accccactct gtgtcacttt 660
aaactgtact gctaatataa ccaacaatgc taatataacc aacaatgcta atataaccaa 720
ctataataat gaaactgaca tgagaaattg ctctttcaat ataaccacag aattaagaga 780
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gtatgctcct ccaattaaag gaaacataac atgtaaatca aatatcacag gactactatt 1620
aacacgtgat ggagggacaa atgacacaga gacaccagag acattcagac ctggaggagg 1680
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SEQ 83

154   *β*

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taatataaca aattggctgt ggtatataaa aatattcata atgataatag gaggcttgat 2340
aggtttaaga ataatttttg ctgtgctctc tatagtaaat agagttaggc aggggtactc 2400
acctttgtcg ttgcagaccc ttatcccaac cccgagggaa ccagacaggc tcggaagaat 2460
cgaagaagaa ggtggagagc aagacagaga cagatcaatt cgattagtga acggattctt 2520
agcacttgtc tgggacgacc tccggagcct gtgcctttc agctaccacc gcttgagaga 2580
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<210> 88
<211> 261
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96AM751.3; gene=vpu

<400> 88
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ctaatcatag caatagctgt gtggatcata gtatatatag aatatagaaa attgtcaaga 120
caaagaaaaa tagaccggtt aattaaaaga attagagaaa gggcagaaga cagtggcaat 180
gagagtgaag gggataatga ggaattggca acaatggtgg atatggggca tcttaggctt 240
ttggatgcta ttgatgtgta a                                         261
```

<210> 89
<211> 2544
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=96AM751.3; gene=env

<400> 89
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ttttggatgc tattgatgtg taatgcaatg gggaaattgt gggtcacagt ctactatggg 120
gtacctgtgt ggaaagaagc aaaaactact ttattttgtg catcagatgc taaagcatat 180
gagacagaag tgcataatgt ttgggctaca catgcctgtg tacccacaga ccccaaccca 240
caagaaatgg ttttggaaaa tgtaacagaa agtttaaca tgtgggaaaa taacatggtg 300
gatcagatgc atgaggatat aatcagttta tgggaccaaa gcctaaagcc atgtgtaaag 360
ttgaccccac tctgtgtcac tttaaactgt actgctaata taaccaacaa tgctaatata 420
accaacaatg ctaatataac caactataat aatgaaactg acatgagaaa ttgctctttc 480
aatataacca cagaattaag agataagagg aggcaagtag atgcactctt ttataaactt 540
gatatagtac caattaatga gaattccagt gaatatagat aataaattg taatacctcg 600
gccataacac aagcatgtcc aaaggttact tttgacccaa tccctataca ttattgtgct 660
ccagctggtt atgcgattct aaagtgtaac aataagacat caatggaac aggaccatgc 720
aataatgtca gcacagtaca atgtacacat ggaattaagc cagtagtatc aactcaatta 780
```

<div align="center">SEQ 84</div>

/55   B

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    aacaataata caaggaaaag tgtgaggata ggaccaggac aaacattcta tgcaacagga 960
    gaaataatag gaaatataag acaagcatat tgtaacatca gtgaaggcaa atggaataac 1020
 5  actctacaaa gggtaggtga aaaattaaga aaatacttcc ctaataaaac aataagcttt 1080
    gcaccatcct caggagggga cctagaaatt acaacacata gctttaattg tagaggagaa 1140
    tttttctatt gcaatacatc aaaactgttt aatggtacgt ttaatggtac aaacacttct 1200
    aatgatagaa gtaattcgac cattacgctt caatgcagaa taaaacaaat tacaaacatg 1260
    tggcagggggg taggacaagc aatgtatgct cctccaatta aaggaaacat aacatgtaaa 1320
10  tcaaatatca caggactact attaacacgt gatggaggga caaatgacac agagacacca 1380
    gagacattca gacctggagg aggagacatg aaggacaatt ggagaagtga attatataaa 1440
    tataaagtgg tagaaattaa gccattagga gtagcaccca ctaaggcacg aaggagagtg 1500
    gtggagagag aaaaaagagc agtaggaata ggagctgtgt ccttgggtt cttgggagca 1560
    gcaggaagca ctatgggcgc agcatcaata acgctgacgg tacaggtcag acaattattg 1620
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    aatagagtta ggcaggggta ctcacctttg tcgttgcaga cccttatccc aaccccgagg 2160
    gaaccagaca ggctcggaag aatcgaagaa gaaggtggag agcaagacag agacagatca 2220
25  attcgattag tgaacggatt cttagcactt gtctgggacg acctccggag cctgtgcctt 2280
    ttcagctacc accgcttgag agacttcata ttgattgcag cgaggggact acagaggggg 2340
    tgggaaactc ttaagtatct ggggagtctt gtacagtatt ggggtctaga gctaaaaaag 2400
    agtgctatta gtttgcttga tactatagca atagcagtag ctgaaggaac agatagaatt 2460
    atagaattaa cacaaagaat ttgtagagct atccgcaacg tacctagaag aataagacag 2520
30  ggctttgaag cagctttgca ataa                                         2544

    <210> 90
    <211> 624
    <212> DNA
35  <213> Human immunodeficiency virus type 1

    <220>
    <223> isolate=96AM751.3; gene=nef

40  <400> 90
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    gcaagaactg atccagcagc agaggggagta ggagcagcgt ctcaagactt agataaatat 120
    ggggcactta caagcagtaa cacaagtacc aataatgctg attgtgcctg gctggaagcg 180
    caagaggagg agggagaagt aggctttcca gtcagacctc aggtaccttt aagaccaatg 240
45  acttataagt cagcatttga tctcagcttc tttttaaaag aaaagggggg actggatggg 300
    ttaatttact gtaagaaaag acaagaaatc ctcgatttgt gggtctatca cacacaaggc 360
    tacttccctg attggcaaaa ctatacaccg gaccaggga tcagatatcc actgaccttt 420
    ggatggtgct acaagctagt gccagttgac ccaagggaag tagaagaagc aacgaagga 480
    gaggacaact gtttgctaca ccctataagc cagcatggaa tagaagatga agacagagaa 540
50  gtattaaggt ggaagtttga cagttcccta gcacgcagac acatggcccg cgagctacat 600
    ccggagtatt acaaagactg ctga                                         624

    <210> 91
    <211> 1491
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SEQ 85

156

B

<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CY017.41; gene=gag

<400> 91
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ctggagaaat tctcaattaa ccctggcctt ttagaaacac cagagggatg tagacaaata  180
ataaggcagt tacaaccagc tctccaaaca ggaacagaag aacttaaatc attatataat  240
acagtagtag tcctctactg ggtacatcaa agggtagatg taaaagacac caaggaagct  300
ctagataaaa tagaggaaga acaaaacaag cagaaaacac agcatgcagc agctgacaca  360
gggaacagca gcagtcaaaa ttatcccata gtgcaaaatg cacaagggca aatggtacac  420
caggctatat cacctaggac gttgaatgcc tgggtcaaag tagtagaaga aaaggctttc  480
agcccagaag taatacctat gtttacagca ttatcagaag agccacccc acaagactta   540
aatactatgc taaacacagt ggggggacat caagcagcta tgcaaatgtt aaaagatacc  600
atcaatgagg aagctgcaga atgggacagg gtacatccag tacatgcagg gcctattcca  660
ccaggccaga tgagagaacc aaggggaagt gacatagcag gaactactag tacccttcag  720
gaacaaatag gttggatgac cagcgatcca cccatcccag tgggagaaat ttataaaaga  780
tggataatcc tgggattaaa taaaatagta agaatgtata gccctgtcag cattttggac  840
ataagacaag ggccaaaaga accctttaga gattatgtgg ataggttctt taaaactcta  900
agagctgagc aagccacaca ggaggtaaaa aactggatga cggacacctt gctggtccaa  960
aatgcgaacc cagattgtag atccatcttg agagcattag gaccaggggc ctcattagaa 1020
gaaatgatga cagcatgtca gggagtggga ggacccagcc ataaagcaag ggttttggct 1080
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tgcagggccc ctaggaaaaa gggctgctgg aaatgtggaa aggaaggaca tcaaatgaaa 1260
gattgcactg agagacaggc taattttta gggaaaattt ggccttccaa caaagggagg 1320
ccaggaaatt ttcctcagag cagaacagag ccaacagccc caccagcaga gaacttgaga 1380
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cctgcaattt ccctcaaatc actctttggc aacgacccct tgttacagta a           1491
```

<210> 92
<211> 3012
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CY017.41; gene=pol

<400> 92
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aacagagcca acagccccac cagcagagaa cttgagaatg ggggaagaga taacctcctc  120
cctgaagcag gaactggaga ccaggaacc atacaatcct gcaatttccc tcaaatcact  180
ctttggcaac gacccttgt tacagtaaag atagagggac agctaaaaga agctctatta  240
gatacaggag cagatgatac agtgttagaa gaaataaatt gccaggaaa atggaaacca  300
aaaatgatag ggggaattgg aggttttatc aaagtaagac aatatgatca gatagctata  360
gaaatttgtg aaaaagggc cataggtaca gtattagtag gacctacccc tgtcaacata  420
atcggaagaa atatgttggt tcagcttggt tgtactttaa attttccaat tagtcctatt  480
gaaactgtac cagtaaaatt aaagccagga atggatggtc caaaggttaa acaatggcca  540
ttgacagaag aaaaaataaa agcattaaca gaaatctgta agaaatgga aaaggaagga  600
aaaatttcaa aaattgggcc tgaaaatcca tacaacactc cagtgtttgc tataaagaaa  660
aaagacagca ctaaatggag aaaattagta gatttagag aactcaataa gagaactcaa  720
```
                              SEQ 86

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        gacttctggg aagttcagtt aggaatacca catccagcag gattaaaaaa gaaaaaagca 780
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        aaatatactg cattcaccat acctagtacc aacaatgaga caccaggagt taggtatcag 900
        tacaatgtac ttccacaggg atggaaagga tcaccagcaa tattccagag tagcatgaca 960
     5  aagatcttag agccctttag atcaaagaat acagaattaa tcatctacca atacatggat 1020
        gacttgtatg taggatctga tttagaaata agccagcata gagtaaaaat agaggaatta 1080
        agggctcact tattgaaatg gggatttttat acaccagaca aaaaacatca gaaagaacct 1140
        ccatttcttt ggatgggata tgagcttcat cctgacaaat ggacagtcca gcctataaag 1200
        ctgccagaaa aagacagctg gactgtcaat gatatacaga aattagtagg gaaattaaat 1260
    10  tgggcaagtc agatttatgc agggattaaa gtaaagcaac tgtgtaaact ccttagagga 1320
        gccaaagcac taacagacat agtaacactg actaagaag cagagttaga attagaagag 1380
        aacagggaaa tttttaaaaac ccctgtacat ggggtatact atgacccatc aaaagactta 1440
        atagcagaaa tacagaaaca agggcaagac caatggacat atcaaattta tcaggaaccc 1500
        tttaagaatc tgaaaacagg gaaatatgca aaaaggaggt ccacccacac taatgatata 1560
    15  aaacagttaa cagaagcagt acaaaaaata accatggaaa gcatagtgat atggggaaag 1620
        actcctaaat ttaaattacc catacaaaag gaaacatggg agacatggtg gcggagtat 1680
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        gctaatagag agactaaact aggaaaggca gggtatgtca ctgacagagg aagacaaaaa 1860
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        ttacaggatt caggattaga agtgaacata gtgacagatt cacagtatgc attaggaatc 1980
        attcaagcac aaccagaaag gagtgaatca gagatagtca atcaaataat agaaaaatta 2040
        atagaaaagg aaagggtcta cctatcatgg gtaccagcac acaaagggat tggaggaaat 2100
        gaacaagtag acaaattagt cagttctgga atcaggaaag tgctattttt agatgggata 2160
    25  gataaggctc aagaggaaca tgaaagatat cacagcaatt ggagagcaat ggctcatgac 2220
        tttaatctac cacctgtagt agcaaaagaa atagtagcta gctgtgataa atgtcagcta 2280
        aaaggggaag ccatgcatgg acaagtagac tgtagtccag gaatatggca actagattgc 2340
        acacatcttg aaggaaaagt tatcctggtg gcagtccatg tggccagtgg ctatatagaa 2400
        gcagaagtca tcccaacaga aacaggacag gatacagcat actttatatt aaaactagca 2460
    30  ggaagatggc cagtaaaagt aatacataca gacaatgggc ccaatttcat cagtgcaaca 2520
        gttaaggcag cctgttggtg ggcaggtatc caacaagaat ttgggattcc ctacaatccc 2580
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        aaaagaaaag ggggattgg gggatacagt gcaggggaaa gaataataga cataatagca 2760
    35  acagatatac aaactaaaga actacaaaga caaattacaa aaattcaaaa ttttcgggtt 2820
        tattacaggg acagcagaga tccaatttgg aaaggaccag caaaactcct ttggaaaggt 2880
        gaaggggcag tagtaataca agacaatagt gacataaagg tagtaccaag aagaaaagca 2940
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        gatgaggatt ag                                                    3012
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        <211> 579
        <212> DNA
        <213> Human immunodeficiency virus type 1
    45
        <220>
        <223> isolate=94CY017.41; gene=vif

        <400> 93
    50  atggaaaaca gatggcaggt gatgattgtg tggcaggtag acaggatgag gattagaaca 60
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        aaacatcact atgaaagcag aaatccaaga ataagttcag aagtacacat cccgctaggg 180
        gaggctagaa taatagtaag aacatattgg ggtctgcaca taggagaaaa agactggcac 240
        ttgggtcatg gagtctccat agaatggagg caaaacaggt atcatacaca aatagaccct 300
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SEQ 87

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        gatctggcag accatctaat ccatctgtat tattttgact gttttcaga atctgccata 360
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        aaggtagggt ctctgcaata tttggcattg aaagcagtag tagcttcaac aaggacaaag 480
        ccacctttgc ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaagacc 540
    5   aagggccaca gagggagcca tacaatgaat ggatgttag                         579


        <210> 94
        <211> 291
        <212> DNA
    10  <213> Human immunodeficiency virus type 1


        <220>
        <223> isolate=94CY017.41; gene=vpr


    15  <400> 94
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        ggcctaggac aatacatcta taatacctat ggggatacct gggaaggagt tgaagttatc 180
        ataagatatc tgcaacaact actgtttgtc catttcagaa ttgggtgcca acatagcagg 240
    20  ataggcatta ttcgaagaag aagagtaagg gatggagcca gtagaccccta a           291


        <210> 95
        <211> 2655
        <212> DNA
    25  <213> Human immunodeficiency virus type 1


        <220>
        <223> isolate=94CY017.41; gene=tat


    30  <400> 95
        atggagccag tagaccctaa actagagccc tggaaccatc cgggaagtca gcctaaaact 60
        gcttgtacca aatgttattg taaacgctgt tgctatcatt gccagttgtg ctttataaac 120
        aaaggcttag gcatctccta cggcaggaag aagcgacgac cccgacgaaa gccttctcca 180
        agcaataagg accatcaaaa tcctatacca aagcagtaag tagtagtaat aatatatgt 240
    35  aatgttacct ttagtaatat tggcaatagt aggactgata gtagctttaa tcttagcaat 300
    •   agttgtatgg actatagtat tcatagaata taagaaaatt aagaagcaaa ggaaaataga 360
        ctggttaatc aaaagaataa gtgagagagc agaagacagt ggcaatgaga gtgatgggga 420
        cacagaggaa ctatcagcac ttgtggagag ggggcatctt gattttgggg atgttaataa 480
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    40  cagataccat cctattttgt gcatcagatg ctaaagcata tgatacagaa gtgcataatg 600
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        atgtaacaga aaatttaat atgtggaaaa ataacatggt agagcagatg caagaagata 720
        taatcagctt atgggatcaa agcctaaagc catgtgtaaa attaaccccg ctctgcgtca 780
        ttttaaattg tagcaatgcc ataccagca cccatagcaa tagcagtagc acccagagcc 840
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        ctggttttgc gattctaaag tgtaaggatc gagattcaa tggaacaggg tcatgcaaga 1140
    50  atgttagctc agtacaatgt acacatggaa ttaaaccagt agcatcaact caactgctgt 1200
        tgaatggcag tctagcagaa ggagggaaaa taatgattag atctgaaaat attacaaaca 1260
        atgccaaaaa cataatagtt cagtttacta gcctgtact aattacttgt atcagaccca 1320
        acaacaatac aagaaaaagt atacgctttg gaccaggaca agccttctat acaaatgaaa 1380
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<div align="center">SEQ 88</div>

159

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        tctattgcaa tacaacaggc ctgtttaatg gtacgtggtg gaacaatggt acgtggaacg 1620
        ggccctacac acctaataac accaatggaa gtataatcct cccatgcaga ataaaacaaa 1680
    5   ttataaacat gtggcagaga gtaggaagag caatgtatgc ccctcccatt gcaggaataa 1740
        taaagtgtac atcaaacatt acaggaataa tattgacaag agatggtggt aacaatggga 1800
        ctaatgagac cttcagacct ggaggaggag atatgaggga caattggaga agtgaattat 1860
        ataaatataa agtagtaaaa cttgaaccac taggagtagc acctaccagg caaaaagaa 1920
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    10  gagcagcagg aagcactatg ggcgcggcgt cactaacgct gacggtacag gccagacaat 2040
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        atctgttgaa actcacagtc tggggcatta aacagctcca ggcgagggtc ctggctgtgg 2160
        aaagatacct aaaggatcaa cagctcctgg gaatttgggg ctgctctgga aaactcatct 2220
        gcgccactac tgtgccctgg aacactagtt ggagtaataa gtctcaggat gagatttggg 2280
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        ggttacttga agaatcgcaa aaccagcagg aaaagaatga gcaagactta ttggcattag 2400
        acaaatgggc agatttgtgg agttggttca catttcaca ctggctgtgg tatataagaa 2460
        tatttataat gatagtagga ggcttgatag gattaagaat agtttttgct ataattactg 2520
        tagtaaatag agttaggcag ggatactcac ctgtgtcatt tcagatccct accccaagcc 2580
    20  cagagggtcc cgacaggccc agaggaaccg aagaaggagg tggagagcaa ggcagagaca 2640
        gatcgattcg attag                                                 2655


        <210> 96
        <211> 2721
    25  <212> DNA
        <213> Human immunodeficiency virus type 1


        <220>
        <223> isolate=94CY017.41; gene=rev
    30

        <400> 96
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        atcctatacc aaagcagtaa gtagtagtaa ttaatatatg taatgttacc tttagtaata 120
        ttggcaatag taggactgat agtagcttta atcttagcaa tagttgtatg gactatagta 180
    35  ttcatagaat ataagaaaat taagaagcaa aggaaaatag actggttaat caaaagaata 240
      . agtgagagag cagaagacag tggcaatgag agtgatgggg acacagagga actatcagca 300
        cttgtggaga gggggcatct tgattttggg gatgttaata atgtgtaaag ctacagattt 360
        gtgggtcaca gtatactatg gagtacctgt gtggaagat gcagatacca tcctattttg 420
        tgcatcagat gctaaagcat atgatacaga agtgcataat gtatgggcca cacatgcctg 480
    40  tgtacccaca gaccccaacc cacaagaaat aaacctggaa aatgtaacag aaaatttaa 540
        tatgtggaaa aataacatgg tagagcagat gcaagaagat ataatcagct tatgggatca 600
        aagcctaaag ccatgtgtaa aattaacccc gctctgcgtc attttaaatt gtagcaatgc 660
        caataccagc acccatagca atagcagtag cacccagagc cccattaatg aagaaataaa 720
        aaactgctct tacaatacta ccacaatact aagagataag acacaaaaag tttattcact 780
    45  gttttataga cttgatgtag tacaacttga tgaaagtgaa aataagaata catcaggtag 840
        taatactctg tatagactaa taaattgtaa tacctcaacc atcacacaag cgtgtccaaa 900
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        tacacatgga attaaaccag tagcatcaac tcaactgctg ttgaatggca gtctagcaga 1080
    50  aggagggaaa ataatgatta gatctgaaaa tattacaaac aatgccaaaa acataatagt 1140
        tcagtttact aagcctgtac taattacttg tatcagaccc aacaacaata caagaaaaag 1200
        tatacgcttt ggaccaggac aagccttcta tacaatgaaa ataataggg acataagaca 1260
        agcacattgt aatatcaaca aaacattatg gaatgacact ttacaaaagg tagctgaaca 1320
        attaagagag aaattcccta agaaaaccat aatctttact aactcctcag gagggggaccc 1380
                                    SEQ 89
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        agaaattaca acacttagtt ttaattgtgc aggagaattt ttctattgca atacaacagg 1440
        cctgtttaat ggtacgtggt ggaacaatgg tacgtggaac gggcccctaca cacctaataa 1500
        caccaatgga agtataatcc tcccatgcag aataaaacaa attataaaca tgtggcagag 1560
        agtaggaaga gcaatgtatg cccctcccat tgcaggaata ataaagtgta catcaaacat 1620
   5    tacaggaata atattgacaa gagatggtgg taacaatggg actaatgaga ccttcagacc 1680
        tggaggagga gatatgaggg acaattggag aagtgaatta tataaatata agtagtaaa  1740
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  10    acagcaaagc aatttgctgc aggctataga agctcaacag catctgttga aactcacagt 1980
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        caagggactg agactggggt gggaaggtct caagaatctg tggaatcttc tgttatactg 2700
        gggtcgggaa ctgaagaata g                                          2721


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        <211> 246
        <212> DNA
        <213> Human immunodeficiency virus type 1


  30    <220>
        <223> isolate=94CY017.41; gene=vpu


        <400> 97
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  35    gttgtatgga ctatagtatt catagaatat aagaaaatta gaagcaaag gaaaatagac 120
      . tggttaatca aaagaataag tgagagagca gaagacagtg caatgagag tgatggggac 180
        acagaggaac tatcagcact gtggagagg gggcatcttg attttgggga tgttaataat 240
        gtgtaa                                                           246
        .
  40    <210> 98
        <211> 2598
        <212> DNA
        <213> Human immunodeficiency virus type 1


  45    <220>
        <223> isolate=94CY017.41; gene=env


        <400> 98
        atgagagtga tggggacaca gaggaactat cagcacttgt ggagagggg catcttgatt 60
  50    ttgggatgt taataatgtg taaagctaca gatttgtggg tcacagtata ctatggagta 120
        cctgtgtgga aagatgcaga taccatccta ttttgtgcat cagatgctaa agcatatgat 180
        acagaagtgc ataatgtatg gggccacacat gcctgtgtac ccacagaccc caacccacaa 240
        gaaataaacc tggaaaatgt aacagaaaat tttaatatgt ggaaaaataa catggtagag 300
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                                 SEQ 90
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1lo1

B

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acccccgctct gcgtcatttt aaattgtagc aatgccaata ccagcaccca tagcaatagc 420
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atactaagag ataagacaca aaaagtttat tcactgtttt atagacttga tgtagtacaa 540
cttgatgaaa gtgaaaataa gaatacatca ggtagtaata ctctgtatag actaataaat 600
tgtaatacct caaccatcac acaagcgtgt ccaaaggtaa cctttgagcc aattcctata 660
cattattgtg ccccagctgg ttttgcgatt ctaaagtgta aggatccgag attcaatgga 720
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tcaactcaac tgctgttgaa tggcagtcta gcagaaggag ggaaaataat gattagatct 840
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gaaagggctt tactataa                                              2598
```

<210> 99
<211> 654
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94CY017.41; gene=nef

<400> 99
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actaatcctg attgcgcctg ggtggaagcg caagaagagg agagtgaagt aggcttccca 240
gtcaggccac aggtaccttt aaggccaatg accttcaagg gagcgtttga tctcagcttc 300
tttttaaaag aaaagggggg actggatggg ttaatttact cccagaaaag acaagacatc 360
```

SEQ 91

```
cttgatatgt gggtctacca cacacaaggc tacttccctg attggcagaa ttacacacca 420
gggccaggga tcagataccc attaacattt ggatggtgct tcaagctagt accagtagag 480
ccatctgagg tagaagaagc tactcaggga gagaacaaca gcttattaca ccctatatgc 540
caacatggag tagatgaccc tgaaagagaa gtgttaagat gggagtttga tagaagcctg 600
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```

<210> 100
<211> 1476
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94IN476.104; gene=gag

<400> 100
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ctggaaagat ttgcgcttaa ccctggcctt ttagagacgt cagacggatg taaacaaata 180
ataaaacagc tacatccagc tcttaagaca ggaacagagg aacttaggtc attattcaac 240
acagtagcaa ctctctattg tgtacatgca gggatagagg tacgagacac caaggaagcc 300
ttagacaaga tagaggaaga acaaaacaaa agtcagcaaa aaatacagca ggcaaaagag 360
gctgacggaa aggtcagtca aaattatcct atagtgcaaa atctccaagg gcaaatggta 420
caccagcccc tatcacctag aactttgaat gcgtgggtaa aagtaataga ggagaaggct 480
tttagcccag aggtaatacc catgttcaca gcattatcag aaggagccac ccctctgat 540
ttaaacacca tgttaaatac agtggggggga catcaagcag ccatgcaaat gttaaaagat 600
accatcaacg aggaggctgc ggaatgggat agattacatc cagtacatgc agggcctaat 660
ccaccaggcc agatgagaga accaagggga agtgatatag caggaactac tagtaccctt 720
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agatggataa ttctgggggtt aaataaaata gtaagaatgt atagccctgt cagcattttg 840
gacataagac aagggccaaa ggaacccttt agagactatg tagaccggtt ctttaaaact 900
ttaagagctg aacaagctac acaagaagta aaaggttgga tgacagacac cttgttggtc 960
caaaatgcaa acccagattg taagaccatt ttaagagcat taggaccagg ggcttcatta 1020
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gctgaggcaa tgagccaatc acatagtaac ataatgatgc agagaggcaa ttttaaaggc 1140
cctaaaagaa ttgttaaatg cttcaactgt ggcaaggaag gcacatagc cagaaattgc 1200
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aaggagacaa cccccgctcc gaagcaggag tcgaaagaca gggaacccctt aacttccctc 1440
aaatcactct ttggcagcga ccccttgtct caataa                          1476
```

<210> 101
<211> 3011
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94IN476.104; gene=pol

<400> 101
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gaagcaggag tcgaaagaca gggaaccctt aacttccctc aaatcactct ttggcagcga 180
ccccttgtct caataaaagt aggggggcag ataaaggaag ctctcttaga cacaggagca 240
```
                              SEQ 92
```
```

```
        gatgatacag tattagaaga aatagctttg ccaggaagat ggaaaccaaa aatgatagga 300
        ggaattggag gttttatcaa agtaagacag tatgatcaaa tacttataga aatttgtgga 360
        aaaaaggcta taggtacagt attagtagga cctacacctg tcaacataat tggaagagat 420
        atgttgactc agcttggatg cactctaaat tttccaatta gccccattga aactgtacca 480
   5    gtaaaattaa agccaggaat ggatggccca aaggttaaac agtggccatt gacagaagag 540
        aaaataaaag cattaacaga aatttgtaaa gaaatggaga aggaaggaaa aattacaaaa 600
        attgggcctg aaaatccata taacactcca gtatttgcca taaaaaggaa ggacagtact 660
        aagtggagaa aattagtaga tttcagggag ctcaataaaa gaactcaaga cttttgggaa 720
        gttcaattag gaataccaca cccagcaggt ttaaaaaaga aaaaatcagt gacagtactg 780
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        gactacccat ccaaaaagaa acgtgggaga catggtggac agactattgg caggccacct 1680
   25   ggattcctga ttgggagttt gttaataccc ctcccctagt aaaattatgg taccagctag 1740
        aaaaagaacc catagtagga gcagaaactt tctatgtaga tggagcagct aatagggaaa 1800
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        ctgaaacaac aaatcagaag actgaattgc aagcaattca gctagctttg caagattcag 1920
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        ctaaagaatt acaaaaccaa attacaaaaa ttcaaaattt tcgggtttat tacagagaca 2820
        gcagagaccc catttggaaa ggaccagcca aactgctctg aaaggtgaa ggggcagtag 2880
   45   taatacaaga taatagtgac ataaaggtag tgccaaggag aaagcaaaa attattaggg 2940
        attatggaaa acagatggca ggtgctgatt gtgtggcagg tagacaggat gaggatcaga 3000
        acatggaata g                                                       3011
```

<220>
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<210> 102
<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1
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<220>

SEQ 93

164

β

<223> isolate=94IN476.104; gene=vif

<400> 102
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agacatcatt atgaaagcag acatccaaaa gtaagtgcag aagtacacat cccattagga 180
gatgctagat tagtaataaa aacatattgg ggtttacaaa caggagaaag agattggcat 240
ttgggtcatg gcgtctccat agaatggaga ttgggaagat atagcacaca agtagaacct 300
ggcctggcag accagctaat ccatatgcat tattttgatt gttttgcaga ctctgccata 360
agaaaagcca tattaggaca catagttatt tctaggtgtg attatcaagc aggacataat 420
aaggtaggat ctctacaata cttggcactg acagcattga taaaaccaaa aaagagaaag 480
ccacctctgc ctagtgttaa gaaattagta gaggatagat ggaacaatcc ccagaagacc 540
agggaccaca gagggaacca tacaatgaat ggacactag                        579
```

<210> 103
<211> 291
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94IN476.104; gene=vpr

<400> 103
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gagcttctag aggaactcaa gcaggaagct gtcagacact tcctagacc ttagcttcat 120
agcttaggac aatatatcta tgaaacatat ggggatgctt ggacaggagt cgaagcttta 180
ataagaacac tgcaacaatt actgtttatt catttcagaa ttgggtgcca gcatagcaga 240
ataggcattt tacaacggag aagagcaaga aatggagcca gtagatccta a           291
```

<210> 104
<211> 2633
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<223> isolate=94IN476.104; gene=tat

<400> 104
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gcttgtaata catgctattg taaacactgt agctaccatt gtctagtttg ctttcagaca 120
aaaggcttag gcatttccta tggcaggaag aagcggagac agcgacgcag cgctcctcca 180
agcagtgagg atcatcaaaa tcttatatca aagcagtaag tatatgtaat ggtgaattta 240
ttagaaagag tagattatag attaggagta ggagcattaa tagtagcatt aatcttagca 300
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aacaggttaa ttgaaagaat tagggaaaga gtagaagaca gtggcaatga gagtgagggg 420
gatactgagg aattgtcaac actggtggat atggggaatc ttaggctttt ggatgctaat 480
gatttataat gtagtaggga acttgtgggt cacagtctat tatggggtac ctgtgtggaa 540
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```

SEQ 94

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      taaagatgag acattcaatg ggacaggacc atgcaaggag gtcagtacag tacaatgtac 1140
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      agagataata actagatctg aaaatataac agacaatgca aaaactataa tagtacatct 1260
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      gggcattaag cagctccaga caagagtctt ggctatagag agatacctaa aggatcaaca 2160
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      ctccagctgg agtaataaat caaaagatga tatttggaat aacatgacct ggatgcagtg 2280
      ggataaagag attagtaatt acacaaacac aatataccgg ttgcttgaag aatcgcaaat 2340
      ccagcaggaa caaaatggaa aagatttatt agcattggac agttggcaaa atctgtggaa 2400
      ttggtttagc ataacaaaat ggctgtggta tataaaaata ttcataatta tagtaggagg 2460
      cttgataggt ttgagaataa tttttgctgt gctatctata gtaaatagag ttaggcaggg 2520
      atactcacct ttgtcgttgc agacccttac cccagacccg agggaacccg acaggctcag 2580
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      <210> 105
      <211> 2651
      <212> DNA
      <213> Human immunodeficiency virus type 1

      <220>
      <223> isolate=94IN476.104; gene=rev

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      gattaggagt aggagcatta atagtagcat taatcttagc aataattgtg tggaccatag 180
      catatctaga atataggaaa ttgttaagac aaagaaaaat aaacaggtta attgaaagaa 240
      ttagggaaag agtagaagac agtggcaatg agagtgaggg ggatactgag gaattgtcaa 300
      cactggtgga tatggggaat cttaggcttt tggatgctaa tgatttataa tgtagtaggg 360
      aacttgtggg tcacagtcta ttatggggta cctgtgtgga agaagcaaa aactacttta 420
      ttctgtgcat cagatgctaa agcttatgag aaggaggtgc ataatatctg gctacacat 480
      gcctgtgtac ccacagaccc caacccacaa gagatggatt tagtaaatgt aacagaaaat 540
      tttaacatgt ggaaaaatga catggtggat cagatgcatg aggatgtaat cagtttatgg 600
      gatcaaagcc taaagccatg tgtaaagttg accccactct gtgtcacttt aaactgtagt 660
      aaggttacca ataatgctac ttacaataat actgatgata taaaaaattg ctcttttaat 720
      gcaaccacag aaataagaga caagaaacgc aaagagtatg cactgtttta tagactcgat 780
      atagtaccac taaatgagaa taagaacagc tctagtaact atagtgagta catattaata 840
      aattgtaata cctcaaccat aacacaagcc tgtccaaagg tctctttttga cccaattcct 900
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      gaaaatataa cagacaatgc aaaaactata atagtacatc ttaatgaatc cataaaaatt 1140
      gtatgtacaa gacccaacaa taacacaaga aaaagtataa ggatagggcc aggacaagca 1200
      ttctatgcaa caaacggcat aataggagac ataagacaag cacattgtaa cattagtgaa 1260
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      aattgtggag gagaattctt ttattgtaat acatcaagac tgtttaacgg tacatacaat 1440
      ggtacagaca tgcctacata caatggtaca aattccagtt cagacatcat catgcttcca 1500
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      cccattgaag gaaacataac atgtgaatca aatatcacag gactactatt agtacgtgat 1620
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      caaagaaaaa taaacaggtt aattgaaaga attagggaaa gagtagaaga cagtggcaat 180
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      <220>
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      <400> 107
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SEQ 96

167

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      acaaattcca gttcagacat catcatgctt ccatgcagaa taaggcaatt tataaacatt 1260
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45    <210> 108
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      <213> Human immunodeficiency virus type 1

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168   β

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       acttataaag gagcattcga tctcgccttc tttttaaaag aaaagggggg actggatggg 300
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       tacttccctg attggcaaaa ctacacacca ggaccagggg tcagatatcc actgaccttt 420
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SEQ 98